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A COMPARISON OF ENVIRONMENTAL ATTITUDES, ENERGY PREFERENCES, AND ENERGY CONSERVATION BEHAVIOUR AMONG ENVIRONMENTALISTS, BUSINESS EXECUTIVES, AND THE PUBLIC

by

JONATHAN NOEL RODGERS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF GEOGRAPHY

EDMONTON, ALBERTA

SPRING 1987

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DEGREE FOR WHICH THESIS WAS PRESENTED MASTER OF ARTS

YEAR THIS DEGREE GRANTED SPRING 1987

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Edgar L. Jackson
.....
Supervisor

.....

.....

Date March 17, 1987

Abstract

This thesis represents a step in the investigation of environmental attitudes and their influence on preferences for energy resource options and energy conservation behaviour. The study presents descriptive findings based on a questionnaire survey of the Edmonton public and two distinct target groups during the spring of 1985.

The specific objectives of this study were to compare and contrast these sample groups with regard to their: (1) Opinions and beliefs regarding energy conservation issues; (2) Evaluations of and preferences for energy resource options; (3) Attitudes toward energy, environmental, and lifestyle issues; (4) Adoption of energy conservation practices.

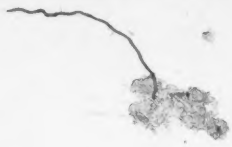
The data were collected using a self-administered questionnaire, hand-delivered to a random sample of 300 households in the city of Edmonton, and mailed to a random sample of 150 Alberta environmentalists and 150 Alberta corporate business executives. Of the 600 questionnaires administered, effective return rates of 72%, 76%, and 53% were achieved among the public, environmentalist, and business executive samples respectively.

Members of the three sample groups are differentiated with respect to their evaluations of and preferences for energy resource options and in their attitudes toward energy, environmental, and lifestyle issues. There are also different and essentially opposing attitudes toward these issues among environmentalists and corporate business executives. Environmentalists are ecocentric in their environmental attitudes, have a preference for the soft energy path, and have lifestyle attitudes consistent with the concept of a "conserver society". Corporate business executives are technocentric in their environmental attitudes, have a preference for the hard energy path, and have lifestyle attitudes consistent with the concept of a "consumer society". The response of the public sample was generally between those of the two target groups.

Variations in the reported energy conservation behaviour of the three sample groups were also apparent. Environmentalists reported a greater range of energy conservation practices than either the public or business executives. Differences in conservation behaviour were also discerned when the environmental attitude of respondents was examined.

Acknowledgements

Many thanks to all of the following for their support and assistance: The Energy Resources Conservation Board and Mr. Frank Mink for kindly agreeing to cover a portion of the costs involved, Dr. Ed Jackson for his advice and patience, committee members Dr. Ken Fairbairn and Dr. Harvey Krahn, Richard Kuhn for his encouragement, and Judy and daughter Jenna, the ones who make it all worthwhile.



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I. INTRODUCTION

A. INTRODUCTION

A major goal of agencies concerned with the management and development of energy resources is one of self-reliance for Canada (Government of Canada, 1976, 1980). Associated with this goal is the need to develop strategies that will sustain a balance between energy supply and demand (Gander and Belaire, 1978). Many authors contend that current energy policy is largely directed towards expanding the supply of conventional resources with little emphasis on the promotion and advancement of effective energy conservation strategies and alternative energy resources (Bott et al., 1983; Jackson and Foster, 1982). One such strategy is to reduce energy requirements through demand management (Grima, 1979). This concept refers to a complex range of actions that recognize, among other things, behavioural adjustments to energy consumption.

Demand management is part of an energy conservation policy which is intimately related to the future of energy, consumer, and environmental policy. Energy conservation, now and in the future, is a most promising energy option which helps to protect the consumer against rising energy costs and the environment against the impact of developing new energy supplies (Solomon, 1978). Since the Arab oil embargo and resulting "energy crisis" of the early 1970s there has been a marked change in the rate of growth of energy demand across Canada: it is now slower than one to two decades ago. There has also been an increase in energy resources available for export, particularly from Alberta. However, recent low energy prices, as a result of a current worldwide oversupply of oil, could reduce the benefits already achieved from the adoption of energy conservation practices among consumers. Lower energy prices may also provide a reason for both federal and provincial governments to view energy conservation as neither a realistic nor a worthwhile policy option. This view could lead toward decisions that ignore the benefits of demand management and energy policies that become increasingly reliant on supply side solutions to future energy needs.

There is also a growing concern that, in the long run, there are limits to an energy intensive way of life if it is to be based solely on a dependence on non-renewable fossil fuels. Energy resources that Canadians have become increasingly dependent on include coal, oil, and natural gas. Nuclear energy, despite some risk to present and future generations, is also considered a promising energy option. A continuing dependence on these non-renewable or "hard-path" energy options has raised some questions concerning their future viability and their implications for society and the environment. It is inevitable that some form of energy transition will occur, and some authors have suggested that the promotion of a "hard path" energy future for Canada should not be a preferred strategy (Brooks, 1981; Solomon, 1980). Energy conservation and renewable resources such as solar energy, wind energy, biomass fuels, and hydro-electric power, i.e. the "soft energy path", may instead be more socially viable and environmentally benign (Lovins, 1977). In this sense, there is a divergence between the desire for a soft path energy future, when all the long-term benefits and costs are accounted for, and a hard path energy future which is currently being promoted between government (Government of Canada, 1984) and industry. Evidence from surveys in Canada and the U.S. suggests a comparable divergence between what the public prefers (the soft path) and the hard energy path they expect to be adopted (Brady, 1980; Farhar et al., 1980).

Many critics of energy policy have stated that energy is no longer a low cost and unlimited resource, and that alternatives are necessary to achieve true energy self-reliance in Canada (Bott et al., 1983). However, there may be difficulty in the social acceptance of some energy alternatives (e.g. nuclear and coal) and a reluctance to conserve energy because it may impinge on individual lifestyles (Lovins, 1977; Solomon, 1978). While a sustainable energy balance is a desirable social goal, it will ultimately depend on demand management (i.e. government incentives and controls) and on the consumer's acceptance of energy conservation. To achieve this goal it is necessary to understand the public's perception of energy conservation, their preferences for energy options, and their present energy conservation behaviour. If energy conservation becomes a desirable and feasible policy option, then its success will depend on decision-makers' knowing about current conservation practices

and what factors influence the decision to conserve energy.

B. ATTITUDES AND ENERGY CONSERVATION BEHAVIOUR

Social scientists have made important contributions to our understanding of the public's opinions, attitudes, values, and beliefs about energy supply, environmental issues, and the relationship between them and energy conservation behaviour. The tenuous linkage of perceptions to behaviours and the aggregation of results in survey analysis has often proved inappropriate to those deciding future energy requirements. Social science research, however, has led to a more thorough conceptualization of energy issues and has developed rigorous methodologies to obtain and analyse questionnaire data. Consequently, the results from such research are becoming more applicable to those deciding energy policy. Recent attention has been focussed on environmental attitudes (belief systems or world views) and their measurement (Cotgrove, 1982; Cotgrove and Duff, 1981; Dunlap and Van Liere, 1978, 1984). There has also been an examination of the extent to which such fundamental attitudes influence energy perceptions (Jackson, 1983, 1985a, 1985b, 1985c) and energy conservation behaviour (Farbrother, 1985; Jackson, 1980a).

Recent work in the area of environmental attitudes has contributed to the understanding of public perceptions of and behaviours toward energy. This body of research has begun to concentrate on dimensions of environmental perceptions and attitudes, which Jackson (1981) has described as an internally consistent set of beliefs and preferences about nature, technology, and the quality of life. These attitudinal dimensions have also been interpreted as an extension of Kuhn's (1970) well known concept of "paradigm" to the socio-cultural level (Dunlap and Van Liere, 1978). Although many of the fundamental dimensions of environmental attitudes have been recognized, linkages with aspects of energy conservation behaviour require empirical verification.

While some studies have primarily focussed on specific issues of environmental concern, Dunlap and Van Liere have examined a wider and more general range of dimensions related to the measurement of environmental attitudes. Their definition of the terms

"Dominant Social Paradigm" (DSP) and "New Environmental Paradigm" (NEP) is a recognition of two mutually exclusive environmental positions. The DSP has been defined as a "constellation of common values, attitudes and shared wisdom about the physical and social environments which constitute a society's basic 'world view'" (Dunlap and Van Liere, 1984, p. 1013). It has been suggested that the DSP represents a belief in the abundance of resources, a devotion to growth, faith in science and technology, a committment to laissez-faire economics, and limited government intervention. Conversely, the NEP is distinguished from the DSP by a mutually exclusive set of beliefs, attitudes, and related strategies. In this respect, the NEP has usually been defined in terms of anti-DSP values and attitudes. This definition embraces the concepts of "a steady-state", "limits to growth", and "spaceship earth" (Cotgrove, 1982; Dunlap and Van Liere, 1978). Other useful ways of describing these "world views" include: "expansionist views" and "limited world views" (M. Russell, 1979) and "technocentric mode" and "ecocentric mode" (O'Riordan, 1976). Each of these descriptions may be considered as being consistent with the definitions of the DSP and the NEP respectively.

A set of assumptions that is similar to dichotomies in energy perceptions and environmental attitudes can also be extended to an individual's perception of his or her own lifestyle. A consideration of lifestyle attitudes, interests, and opinions combines the virtues of demographics with everyday behaviourally oriented facets of people (Plummer, 1974; Wells and Tigert, 1971). This approach is directed at understanding differences in lifestyle which in turn may be helpful to determine the energy conservation opportunities of the consuming public. Lifestyle segmentation techniques tell us things about the public that most researchers did not attempt to quantify in the past. The value of this variable is that it constitutes a useful organizing concept in which a respondent's lifestyle may be classified as being consistent with either a consumer or conserver society. An attitude consistent with either a consumer or conserver lifestyle may, for example, be seen as a component of the fundamental antecedents that affect energy conservation behaviour.

As an initial set of premises for this research, a set of linkages is assumed between an ecocentric environmental attitude, a preference for soft path energy options, and a conserver lifestyle (NEP). A high rate of adoption of energy conservation practices can be expected among respondents who fit this description. Linkages are also assumed between a technocentric environmental attitude, a preference for hard path energy options, and a consumer lifestyle (DSP). Lower rates of adoption of energy conservation practices can be anticipated among respondents who fit this description.

C. RESEARCH OBJECTIVES

The present study is based on ideas from the literature on the measurement of environmental attitudes, and the relationships among these attitudes, energy perceptions, and energy-related behaviours. Previous studies of the public have provided some information on relationships among these variables (Farbrother, 1985; Jackson, 1980a, 1983, 1985a). The present study represents a progression from previous research. It is applied to a more diverse population; it includes a lifestyle variable; and it examines the rationale behind preferred energy options. For comparison purposes, an experimental method was used and differences among the general public and two interest groups (Alberta environmentalists and Alberta corporate business executives) were examined. The comparison of attitudes among diverse interest groups was initially used by Cotgrove (1982) who examined the extent to which beliefs and values of the public differed from those of industrialists, trade union officials, new environmentalists, and nature conservationists.

In order to extend previous research it is useful to compare and contrast the differences among the public, environmentalists, and corporate business executives with respect to their fundamental attitudes, preferences about energy, and energy conservation behaviour. Identifying these differences and similarities in attitude and behaviour may lead toward a theoretical contribution of an improved understanding of human behaviour and a basis from which diverse interest groups can find grounds for compromise. Such an understanding may also contribute to the conservation elements of energy policy and to the

practical application of energy conservation strategies aimed at specific target groups.

Specifically, the objectives of this study are as follows:

1. To analyse differences among the Edmonton public, Alberta environmentalists, and Alberta corporate business executives with regard to their perceptions of energy conservation, and to their attitudes toward the environment, energy, and lifestyle.
2. To measure the evaluations of and preferences for energy resource options of each group and to examine the rationale behind their preferences for energy options in the short run and long run.
3. To examine the number and type of energy conservation behaviours that are reported by respondents from each group.
4. To analyse the degree to which fundamental attitudes and beliefs are responsible for affiliation-based differences in energy preferences and energy conservation behaviour.

To meet these objectives, a self-administered questionnaire survey was designed and implemented to collect the necessary data for statistical analysis. Six hundred questionnaires were distributed in March and April, 1985. Three hundred went to a random sample of Edmonton households and 150 each to representive samples of Alberta environmentalists and Alberta corporate business executives. Of the 600 original questionnaires administered, effective response rates of 72%, 76%, and 53%, respectively, were achieved.

D. THESIS OUTLINE

Chapter 2 is an examination of a behavioural approach to the study of energy concerns, environmental issues, and lifestyles. This is followed by an overview, in Chapter 3, of the methods used to obtain responses from the chosen sample groups. The questionnaire design, the selection of appropriate questions and the attitude statements are also discussed. Chapter 4 contains a comparison of the three sample groups with regard to their perceptions of energy conservation, and their evaluations of, and preferences for, energy options. Chapters 5 and 6 are devoted to the analysis of the attitude scales and their relationship with energy preferences and energy conservation behaviours. The final chapter is a summary of the

results and includes suggestions for further research.

II. ENERGY BEHAVIOUR, ENVIRONMENTAL ATTITUDES, AND LIFESTYLE RESEARCH

A. INTRODUCTION

Since humans first learned to use and to store various forms of potential energy, many changes have occurred in the relationship between humankind and the environment. Accompanying relatively recent technological advances that have improved the standard of living have been the associated problems of environmental pollution, resource depletion, and the social inequities that accompany energy distribution. These problems are compounded by recent discoveries that energy use and misuse have the potential to disrupt ecosystems and therefore threaten the biosphere (e.g. the greenhouse effect). These environmental and resource-related problems now threaten the health and quality of human life to such a degree that most energy decisions made now will not only affect the present generation but future ones as well (e.g. nuclear energy). Some authors disagree with these contentions (e.g. Kahn, 1982; Maddox, 1972, 1975; Simon, 1981; Simon and Kahn, 1984). Other writers on environmental and energy matters maintain that these problems reflect our inability to deal with them while they continue to threaten the ecological stability of the planet (e.g. Brown, 1981; Capra, 1982; Miles, 1976; Ophuls, 1976; Pirages, 1977; Rifkin, 1981).

Recently, social scientists, including many geographers, have undertaken the study of human-environmental relations and associated energy problems. Since the Arab oil embargo of 1973, efforts have been directed toward the study of energy use and misuse. However, these studies have largely been in the form of economic or technological "adjustments" to systems that provide or deliver energy to consumers. Similarily, solutions to environmental problems tend to reflect a considerable faith in the ability of technology to deal with them. The emphasis on economics and technology to solve energy and environmental problems has increasingly come under attack because it fails to recognize such problems as being equally social, political, and ethical in nature (Satin, 1979). It is now recognized that most of these problems can also be approached and understood by a thorough investigation of values,

attitudes, and beliefs of both individuals and society. Authors of studies of human-environment relations contend that the presently held set of values, attitudes, and beliefs cannot handle what are becoming increasingly complex environmental threats within the framework of current social, political, scientific, and economic structures (Cotgrove, 1982; Drengson, 1980; Rifkin, 1981). This assertion is based on the premise that values, attitudes, and beliefs are related to observed behaviours (Sitwell and Latham, 1979). In particular, "attitudes must be considered as a predisposition to action" (Gold, 1980, p. 23). Of interest is the question of attitude change, in knowing whether attitudes can be altered and, if so, whether this leads to modified patterns of behaviour. Therefore, if energy and environmental problems are to be solved, it becomes imperative for researchers to identify those values, attitudes, and beliefs which may be associated with perceptions, preferences, and behaviours.

Recently, a number of geographers have begun to investigate the relationships between environmental attitudes, energy preferences and energy-related conservation behaviours (Farbrother, 1985; Jackson, 1985a, 1985b, 1985c, 1986). These geographers have utilized the cognitive-behavioural approach which focusses on cognitive processes and aggregate research. The cognitive-behavioural approach assumes that (1) there is a direct one-to-one relationship between attitudes and specific resource-related behaviours and (2) society can be represented by an aggregate combination of individual values, attitudes, and beliefs. While such studies have been criticized for having limited explanatory or predictive power (Bunting and Guelke, 1979), the cognitive-behavioural approach has proven to be a most useful organizational framework for the study of environmental attitudes and energy behaviour.

For the present study, the behavioural approach is of direct relevance. The emergence of energy-related research based on the cognitive-behavioural approach will be reviewed and from this perspective it will be argued that this approach provides a useful framework for the analysis of the influence that affiliation (to either environmentalist or corporate business interests) and attitude have on energy preference and conservation behaviour. Current research on environmental attitudes and the use of lifestyle attitude, interest, and opinion surveys will also be addressed. Furthermore, current developments in the measurement of

environmental attitudes will be reviewed and the conceptual framework for this study will be advanced.

B. BEHAVIOURAL GEOGRAPHY

Geographers have been investigating man-environment relations using a behavioural science approach since the 1960s. Only recently have geographers begun to study environmental attitudes, values, beliefs (or world views) and the influence such antecedents have on energy preference and behaviour. While economic, technological design, and the law have been the dominant approaches to energy conservation policy, each approach has limitations with regard to modifying effectively the energy-related behaviour of consumers (Winett and Ester, 1983). A cognitive-behavioural approach in many geographic studies has added to our knowledge of modifying consumer behaviour and may ultimately lead to an effective energy conservation policy.

Within the past twenty years, the behavioural approach used in geographic studies has focussed on environmental perception research and has shifted from natural hazards (Burton et al., 1978; White, 1974) to a consideration of natural resources, especially energy (Jackson and Foster, 1982). Recent geographic research has begun to focus on perceptions, attitudes, and beliefs about the environment and the influence such cognitions have on energy-related behaviours (Farbrother, 1985; Jackson, 1980a, 1985a, 1986).

Behavioural investigations of geographic problems have arisen from a general discontentment, among some geographers, with positivist approaches to the study of spatial phenomena and by the burgeoning development of a behavioural approach in the social sciences. Thus, many human geographers "turned their attention to understanding and explaining the variable perceptions that individuals have towards the environment or specific aspects of the environment" (R. Kuhn, 1986, p. 117). Early geographic studies of this type include environmental hazards (e.g. flood, drought, earthquakes, etc.), facility locations, and resource management. Using a scientific approach, behavioural geographers began to study attitudes toward various environments, perceptions, preferences, and their relation to actual

or reported behaviours.

The common theoretical framework of cognitive or environmental behaviour is based on the assumption that man reacts to his environment as he perceives and interprets it through previous knowledge and experience. This framework developed as limitations to the assumptions of perfect knowledge and economic rationality had forced geographers to find other bases from which man-environment relations could be better understood. Behavioural geographers began to assert that the complexities and apparent unique nature of human activities were a product of an interaction between individuals and their environment. Gold defines behaviouralism as a "means to replace the simplistic and mechanistic conceptions of man-environment theory with versions that take into account the complexities of human behaviour" (Gold, 1980, p. 3). The behavioural approach is based upon observing decision-making behaviour about spatial patterns and processes (Johnston, 1983). This concept of behaviouralism represents a change in the conceptual approach to understanding human behaviour and provides a more realistic view of man.

Despite a plethora of social science research that has used the behavioural approach, two schools of thought have emerged in geography. The strictly humanistic approach considers humans to be individuals that constantly interact with the environment and as an agent of change to both himself and his milieu. This approach has been adopted by historical and cultural geographers and more recently by phenomenologists. The behavioural approach, adopted in this thesis, retains strong links to the positivist-spatial science tradition in geography. The central constructs of this behavioural approach are to "identify how different individuals respond to particular stimuli, to isolate the correlates of those varying responses, and to build models that can predict the probable impact of certain stimuli" (Johnston, 1983, p. 157). Behavioural geography is therefore an alliance with the social sciences which has a large empirical content. Concepts such as perceptions, attitudes, beliefs, and "worldviews" are of direct relevance to this thesis.

The aim of many studies used in behavioural geography is to build general statements out of observations of ongoing processes. These observations attempt to recognize both

natural and social environments and, above all, tend to focus on the individual rather than to approach the problem on the level of the social group (Gold, 1980). The utility of adopting an inductive approach in the present study is twofold. First, the individual is treated as an agent of change to both the external environment and to his or her own social experience. Second, consistent with the research objectives, is the use of a positivist methodology which seeks to explain the relationship between attitude and behaviour. The focus of the present study is to examine attitudes toward energy and environmental issues and their relationship to energy conservation behaviour. The assumptions are:

1. Individuals, from their total life experience, have an internally consistent set of attitudes, beliefs, perceptions, and preferences.
2. Given a unique set of opportunities and constraints the individual formulates goals and objectives that are acted out as behaviours.

These assumptions form the central focus of the behavioural approach used in this thesis.

C. ENERGY PERCEPTION AND BEHAVIOUR RESEARCH

Background

For almost three decades after World War II, abundant and inexpensive energy supplies produced strong economic growth and high standards of living in North America. In the early 1970s, a reduction of oil exports from Arab nations and increases in prices from oil exporting countries resulted in higher fuel costs and gave rise to the term "energy crisis". It soon became apparent that fuel from hydrocarbons was not an unlimited resource and that efforts should turn toward finding more supplies of oil, toward the use of alternative energy sources, and toward energy conservation.

For the most part, it was imperative that the supply of available oil increase, and in Canada, arctic and offshore exploration was expanded. Alternative energy resources were studied and many small scale working models were developed. These developments have even become marketed in North America (e.g. solar energy and wind power) and abroad (e.g.

biogas generators). Energy conservation through efficient energy practices in transportation, industry, commerce, and households was advocated, and energy efficient products became in demand. It soon became obvious that energy plays an important role in individual lifestyles and in the costs and benefits society receives from its use and misuse.

Many authors point to the importance of the potential economic, social-political, and cultural consequences of the choices that must be made regarding Canada's dependence upon dwindling hydrocarbon deposits and available energy alternatives (Bott et al., 1983; Brooks et al., 1983; Hooker et al., 1981). Canada's status as an oil producing nation has been declining for about twenty years and it has been argued that "it is a speculative extreme to continue to assume the delineation and development of unknown petroleum supplies sufficient to provide even the depletion replacement necessary to offset the decline of conventional product over the next decade" (McDougall, 1983, p. 28). Canadian demands for energy have long been recognized; and while these demands are rising only slowly, they are occurring when existing, readily available, and relatively inexpensive reserves of oil and natural gas are rapidly being depleted (Government of Canada, 1976; 1984). So central is the consumption of energy to the North American way of life that energy policy is, in reality, a social policy. If the public is to become involved in policy matters, then it is valuable to examine their perceptions of energy issues and their subsequent response behaviour.

Energy Perception Research

The "energy crisis" spawned a number of studies, and the focus of most energy perception research has been concerned with investigations of energy conservation behaviour and various theoretical conceptualizations of "energy perceptions". While some studies have examined perceptions of the "energy crisis" (Murray et al., 1974), the perceived seriousness of the problem (Jackson, 1980a), and the degree of concern (Cunningham and Lopreato, 1977), other studies have focussed on behavioural measures such as the awareness and adoption of energy conservation practices (Farbrother, 1985; Jackson, 1980a). As noted earlier, much of the research has been undertaken by a variety of academic disciplines and

often lacks a common theoretical perspective (Winett and Ester, 1983). There are, however, a number of bibliographic essays that have summarized some of the more common themes in the literature (Farhar et al., 1980; Jackson and Foster, 1982; Olsen and Goodnight, 1977).

Current research on public perceptions of energy issues has become more focussed than the research which began in 1973 (Newman and Day, 1975). Much of this past research has been concerned with energy perceptions that include knowledge of general energy issues (Brady, 1980), anticipated personal impacts of escalating costs, disruptions, and shortages (Talarzyk and Omura, 1975), and attribution of blame for the "energy crisis"[1] (Hummel et al. 1978). Generally, there has been an increase in public awareness of an energy problem (Olsen and Goodnight, 1977), and among the public these problems have been perceived as serious (Jacobs and Foster, 1980).

Other research on public perceptions of energy issues has produced divergent views that range from government ineptness and manipulation by the oil companies to the belief that the world is facing long term energy problems and that a physical shortage of resources now exists (Cunningham and Lopreato, 1977). Evaluations of the seriousness of energy issues, in view of other pressing problems, have also been studied (Jackson, 1980a, 1980b; McDougall and Keller, 1981). These authors have found that, in the minds of most North Americans, energy as a resource problem is not as important an issue as concerns that include inflation, unemployment, and environmental pollution. Current availability of world oil supplies at competitive prices may have diminished concerns for energy resource problems. This overproduction of oil supplies has in itself become an "energy crisis" to those regions of the world that depend on oil resource revenues (e.g. Alberta, Canada).

The aspect of energy perceptions which was chosen for investigation in this study is the evaluations of and preferences for specific energy resource options. Significant and consistent variations have been identified with regard to expected and preferred energy resources in the future (Brady, 1980; Farhar et al., 1980; Canadian Electrical Association, 1982), to perceived depletion dates for various resources (Cunningham and Lopreato, 1977;

[1] Increasing costs and supply disruptions.

Foster and Jacobs, 1980), to preferences for renewable resources over fossil fuels (Farhar et al., 1980), and to attitudes about conservation versus other options (Union Carbide Corporation, 1980).

A study of Canadian perceptions of future electrical sources, for the next twenty years, found oil and coal energy options to be perceived as the least important in the future. The most important electrical sources were expected to be hydro, solar, nuclear, natural gas, and wind in that order (Canadian Electrical Association, 1982). Other studies have shown that the public would prefer energy programs based on renewable resources, especially solar energy, by the year 2000 (Brady, 1980; Farhar et al., 1980). Similarly, and with reference to the Alberta scene, Jackson (1985a) and Farbrother (1985) found residents of Edmonton and Calgary to show a marked decline in their preference for fossil fuels from the short run (next five years) to the long run (beyond the year 2000). There are also indications that preferences for energy-related options stem from variations in perceptions of the conflict between economic growth and environmental quality (Farhar et al., 1980; Foster and Jacobs, 1980; Kelly, 1982).

Energy Conservation Behaviour

Research has also revealed that the public recognizes the importance of and benefits from efforts to conserve energy and that these perceptions have often been translated into the adoption of energy conservation practices. Many studies have found that since 1973 a large proportion of their samples have initiated simple energy conservation practices. Most of these practices involve a small inconvenience or are adopted at little cost to the respondents. In various U.S. studies, most respondents (60 to 90 per cent) report making adjustments to home heating and lighting (Cunningham and Lopreato, 1977; Perlman and Warren, 1975). Similar findings have also been reported in Canada (Farbrother, 1985; Heslop et al., 1981; Jackson, 1980a; Keller and McDougall, 1980). Jackson (1980a) reported that Edmonton and Calgary residents most commonly adopt such practices as "turn off lights and appliances when not in use" (68%) and "reduce temperature in house" (51.6%). These respondents,

however, were less likely to adopt behaviours that would require greater effort and monetary cost. For example, in a study of the Edmonton public, Farbrother (1985) found that few respondents would adopt such energy conservation practices as "efficient use of water" (18.5%) and use of "alternative transportation" (23.8%).

Low rates of adopting energy conservation practices may be due to the public's lack of awareness of the full range of behaviours or conservation strategies available. Other limitations such as a high initial cost, household circumstance (i.e. rent or own home), and inconvenience may prevent the actual adoption of some practices. One survey indicates that while seven-eighths of Canadians are aware of a home insulation program, only one third have participated in it (Canadian Electrical Association, 1982). While awareness of conservation may seem high, the actual adoption of appropriate conservation behaviour is somewhat lacking. The difference in the range of adjustments percieved and adopted by individuals has been termed the "awareness - adoption gap" (Jackson and Foster, 1982). Awareness "is a necessary but not a sufficient precondition for the adoption of energy conservation practices" (Jackson, 1980a, p. 122). It has also been noted that behavioural adjustments to habitual and ingrained patterns of energy consumption, among the public, may be resistant to change (Sadler, 1980) and may be found to conflict with personal lifestyles (Leonard-Barton, 1981). In addition low energy prices may contribute to the perception that benefits gained from the adoption of some energy conservation practices are only minimal. Although a gap exists between awareness and adoption, the present study will consider only stated (self-reported) behaviours rather than respondent awareness of possible energy conservation practices.

In an examination of measures designed to encourage energy conservation from the perspective of motivation theory, Lazar and Associates (1975) have shown that existing patterns of behaviours are based on such considerations as speed, ease, comfort, novelty, convenience, and status. If patterns of behaviour, which are a result of these motivations, are to change, they suggest: "One must create a motivation to conserve that is strong enough to modify, or, indeed override, the behavioural expression of these other motives" (Lazar and

Associates, 1975, p. 2). This process may be accomplished by extrinsic (rewards, incentives) or intrinsic (changing beliefs, attitudes, and values of society) motivational schemes which may prompt or enhance energy conservation behaviour.

Although the main barriers to energy conservation have been identified as awareness and cost (Jackson and Foster, 1982; Jacobs and Foster, 1979), only limited success has been achieved with measures that have been suggested to date. These measures include tax adjustments, subsidies, public education, information seminars, and awareness programmes (Bott et al., 1983; Workshop on Alternative Energy Strategies, 1977).

Energy Perceptions and Energy Conservation Behaviour

The direction most often taken for understanding and explaining energy behaviour is to identify and interpret the associations that may occur between various indicators of energy perceptions and the adoption of energy conservation practices (Jackson and Foster, 1982). Several energy studies have identified correlations between these perceptions and the propensity to adopt energy conservation behaviours (Brady, 1980; Foster and Jacobs, 1980; Gottlieb and Matre, 1976). Jackson (1980a), for example, found a relationship between the perceived seriousness of Canadian energy problems and the mean number of energy conservation practices adopted. Other linkages have been identified between the propensity to adopt energy conservation practices and the concern over resource scarcity (Keller and McDougall, 1980; McDougall et al., 1979).

There are, however, a number of problems in identifying a direct association between perception and behaviour. For example, while Jackson found that the "proportion of respondents failing to adopt adjustments declined with increases in perceived seriousness (of energy problems)" (Jackson, 1980a, p. 125), Keller and McDougall (1980) found little difference between concerned and unconcerned [2] respondents and their adoption of energy conservation practices. The problems may be linked to the different theoretical constructs of what constitutes an energy perception and the different indicators used to measure energy

[2]Unconcerned about energy shortages and thought that individual efforts to conserve energy were not important.

conservation behaviour.

Socio-economic Variables

Socio-economic variables as sources of variation in both energy perceptions and behaviours have been examined and have often produced contrasting results. Socio-economic variables that have explained variations in energy perceptions and energy conservation behaviour include income (Murray et al., 1974; Newman and Day, 1975), age (Cunningham and Lopreato, 1977; Jackson, 1980a), education, and occupation (Jacobs and Foster, 1980). While income has proven to be a reliable variable for explaining variations in energy consumption, perception of energy problems, and the adoption of energy conservation practices (Cunningham and Lopreato, 1977; Gotlieb and Matre, 1976), this was not a consistent finding in a similar research effort (Murray et al., 1974). Definitive sources of variation in perception and energy behaviour have not yet been established because most of the studies use different definitions of what constitutes an energy perception. Regardless, socio-economic variables are still desirable for explaining variations in perception and behaviour. They are included in most research because of their ease of use and their potential for use as control variables.

Status of Energy Perception and Behaviour Research

Several sets of consistent findings have emerged within the last decade of research into energy perception and conservation behaviour. Most notable are the perceptions related to a belief in and concern about energy resources, and although there is disagreement on "who is to blame" the general public has accepted the reality of energy difficulties. Furthermore, results have also suggested that there is wide support for the development of renewable or alternative energy resources in the near future. Other findings include the widespread adoption of energy conservation practices by the general public. There are, however, notable differences in the adoption of "minimal" types of energy behaviours versus the more "significant" types of energy conservation adjustments available.

Some inconsistencies have been identified with respect to the comparison of results from similar studies and in the relationships between energy perceptions and energy conservation behaviours. These inconsistencies may be attributed to the circumstances and characteristics of the surveys in which the data were collected. A problem also stems from the use of different theoretical constructs which have been used to examine different dimensions of public energy perceptions and behaviours. Since the indicator of what is chosen as an energy perception or an energy conservation behaviour in a given study determines the nature of the response, the degree to which inferences may be drawn between studies is limited. The use of similar operationalized constructs and survey methods may alleviate such inconsistencies and allow better comparisons to be drawn.

Some other problems remain with respect to the research methods used in the analysis of energy perceptions and behaviours. These include the analysis of the public's stated rather than their actual or observed behaviours, the use of socio-economic variables to explain variations in the public's preferences and behaviours, and the failure to recognize the influence that values, attitudes, and beliefs (or world views) may have on both perceptions and actual behaviours. Such shortcomings of the behavioural approach have attracted criticism from geographers who have insisted that behaviour and perception research is of little value in explaining human activity (Bunting and Guelke, 1979).

Despite such criticism, the results from research into public response to the energy issues of the 1970s have formed a generally coherent body of findings. Jackson and Foster comment that "the essential dimensions of perceptions, attitudes, preferences, and behaviour have been identified and described, typologies of behaviour have begun to be developed, some basic understanding of the influences of perceptions, attitudes, and preferences on behaviour has been attained, and there is evidence of socio-economic differences in energy consumption and conservation" (Jackson and Foster, 1982, p. 33).

Research is now at a stage in which the conceptualization of energy issues and the application of more rigorous techniques can be applied to further the analysis of the interrelationships among attitudes, preferences, and behaviour. One of the more fruitful

avenues of research has been the analysis of attitudes, values, and beliefs and their influence on energy resource preferences and energy conservation behaviour (Farbrother, 1985; Jackson 1985a). Replication of these research efforts, using a similar conceptual framework, may reduce the inconsistencies that have occurred between comparisons of previous research efforts.

It is argued that the recognition and use of attitude scales as a measure of internally consistent sets of beliefs (world views) would be more important in determining or influencing behaviour than perceptions of energy issues that have been essentially transitory for the past decade. Attitudes can be conceived of as a collection of thoughts, beliefs, and knowledge (cognitive component), and as evaluations of feelings (affective component) all relating to and describing a central theme or object (Freedman et al., 1974). It is also argued that attitudes toward energy issues, the environment, and lifestyles may be useful for explaining variations in energy preference and energy conservation behaviour. Furthermore, the measurement of enviromental attitudes in terms of paradigms represents a step toward identifying interrelated attitudes rather than just the relative position of the public toward single environmental issues. The use of attitude scales may therefore provide a better framework for analysing the differences in preference and behaviour than the use of socio-economic variables and perceptions of transitory energy issues.

D. ENVIRONMENTAL ATTITUDES AND VALUES

Background

A considerable amount of literature has been aimed at identifying and explaining public attitudes toward the environment in the last two decades. Research efforts have begun to question certain aspects of the modern western world that have been viewed as profoundly unecological and impede recognition of current environmental and resource realities (Dunlap, 1980). Recent efforts to measure attitudes in terms of paradigms or "world views" represent an important move toward our understanding of man's relationship to the environment.

A paradigm is a set of theoretical, methodological, and empirical procedures that have been accepted for use within both academic and scientific communities (T. Kuhn, 1970). A "paradigm shift" occurs when anomolies or problems with an existing paradigm arise and cannot be solved. This shift involves a change in the values, attitudes, and fundamental assumptions (or world views) that form a particular vision of reality. The notion that paradigms are not static but undergo revolutions with accumulated knowledge and experience can also be applied to society (Capra, 1982). Disagreement on the causes and effects of current ecological problems within western society makes the paradigm concept particularly useful for examining the environmental attitudes of the public.

The paradigm that dominates western society is based on the development and rigorous application of science and technology. This paradigm, which has shaped western culture, has led to aquisitive materialism as a measure of quality of life (Gray et al., 1975; Leiss, 1976; Valaskakis et al., 1979), faith in the efficacy of science and technology (Ellul, 1967; Florman, 1981), domination and control over nature (Leiss, 1972; Rifkin, 1981), and the belief in unlimited natural resources (Ophuls, 1976; J. Russell, 1979). While the dominant paradigm has brought us higher material standards of living, efficient production systems, longer lives, and higher education, it has also resulted in problems of growth, control, and distribution (Harman, 1977). Failure to cope with these problems and emerging environmental difficulties resemble anomolies within the dominant paradigm.

A few authors have diagnosed these anomolies and have noted the paradigm shifts that have occurred both in western society and in individual lifestyles (Capra, 1982; Ferguson, 1980; Rifkin, 1981; Satin, 1979). Consideration of the environment, finite resources, and ecological constraints, among others, have been identified as some of the major reasons for shifting away from the paradigm dominating western society. These shifts have ranged from the environment movement of the 1960s to current lifestyles that advocate voluntary simplicity (Elgin, 1982). Questionning the values and attitudes inherent in the dominant paradigm is also found among advocates of environmentalism who recognize that current social and environmental problems may not be resolved because their origins lie within the

success of the dominant paradigm (Sandbach, 1980; Cotgrove, 1982; Drengson, 1980). The measurement of the public's acceptance or rejection of attitudes, values, and beliefs toward the dominant social paradigm represents an improvement in our understanding of "world views" toward the environment.

E. MEASUREMENT OF ENVIRONMENTAL ATTITUDES

Various methods have been used to describe attitudes toward resources and the environment. The method most commonly used has been to develop a series of attitude statements, to administer these to a sample of respondents, and to organize responses into empirically derived factors (Dunlap and Van Liere, 1978; Jackson, 1985a). Past surveys of the public have investigated the extent to which environmentally concerned individuals share patterns of ideological and demographic characteristics (McEvoy, 1972; Tognacci et al., 1972). Education and age, and to a lesser extent,income, occupation, and place of residence, have been related to such variables as awareness of environmental problems, concern about the problems, and willingness to support or take action to solve them (Dunlap, 1975; Buttel and Flinn, 1978), though not all have been significant in every such study.

In this respect, there is difficulty in establishing consistently strong empirical generalizations about the relationships between environmental concern and demographic variables. Van Liere and Dunlap (1980) and Cotgrove (1982) conclude that demographic variables have limited utility in explaining variation in environmental concern because of the widespread distribution of such concern in our society. They also suggest that cognitive (as opposed to demographic) variables explain far more variation in environmental concern. Recent efforts have therefore focussed on the measurement of environmental attitudes in terms of paradigms (Dunlap and Van Liere, 1978, 1984; Farbrother, 1985; Jackson, 1985a, 1985b, 1986).

Development of Environmental Attitude Scales

Dunlap and Van Liere (1978, 1984) have constructed two scales to examine the extent to which environmental attitudes differ among samples of the public. Each scale consists of polarized views regarding the environment. One scale consists of thirty-seven items to measure acceptance of the "dominant social paradigm" (or DSP). Eight dimensions were recognized after the results were factor analysed (factor loadings greater than .40): support for laissez faire government, support for status quo, support for private property rights, faith in science and technology, support for individual rights, support for economic growth, faith in material abundance, and faith in future prosperity (Dunlap and Van Liere, 1984, p. 1020). The second scale was constructed to measure commitment to the "new environmental paradigm" (or NEP) and consisted of twelve items covering a broad spectrum of environmental issues (eg. pollution, population, natural resources). The acceptance of important environmental concepts such as limits to growth, a steady-state economy, and preserving the balance of nature was also measured by this scale.

Results from these initial studies have been encouraging. Dunlap and Van Liere (1978) found that a general public sample of Washington state residents accepted the general contents of the NEP scale to a degree that was greater than expected. They had also hypothesized that a sample of state wide environmental organizations would support the tenets of the NEP to a greater degree than public respondents. This hypothesis proved to be correct (Dunlap and Van Liere, 1978). The relationship between commitment to the DSP and preferences for environmental quality was examined by these authors in a later study. The results from this study "strongly support the hypothesis that commitment to the dominant social paradigm leads to lower levels of concern for environmental protection" (Dunlap and Van Liere, 1984, p. 1023). Their evidence supports the claim that traditional values, implicit in the dominant paradigm, pose barriers to the development of an environmental ethic in society and that if ecological limits to growth and resource scarcity become more pronounced, this paradigm will have difficulty in maintaining the status quo.

Studies from the U.K. have reported similar results to Dunlap and Van Liere (Cotgrove, 1982; Cotgrove and Duff, 1981). Questionnaires were administered to five distinct groups: the public, industrialists, trade union officials, new environmentalists, and nature conservationists. This questionnaire was based on a series of attitude statements that were characteristic of the dimensions of both the NEP and DSP. The nature of the support for these diametrically opposed positions was found among the attitudes of new environmentalists and industrialists. Environmentalists tended to support non-material values, community participation, and were critical of free markets and technological development. In contrast, industrialists advocated economic growth, technological development, and free market mechanisms.

An improved understanding of environmental attitudes among the public and diverse interest groups has come from these initial studies. While previous studies have focussed on superficial measures (attitudes toward specific issues such as pollution, population, or natural resources), Dunlap and Van Liere have focussed on more fundamental value and belief systems (paradigms). Cotgrove, Dunlap and Van Liere have also empirically validated the assumptions that environmental attitudes stem from an emerging environmentalist world view (NEP) and that the values and beliefs which maintain the status quo of western society are consistent with the dominant social paradigm.

F. DELINEATION OF PARADIGMS IN THE LITERATURE

It is now argued that the DSP and NEP are useful descriptions of internally consistent and diametrically opposed positions that have been described in the literature on energy resources and the environment. The DSP is characterized by an internally consistent set of perceptions regarding an effectively unlimited ability of the biosphere to provide resources and to absorb wastes and other impacts, the belief in science and technology, the exploitation of nature, an unbounded faith in economic growth, and the quality of life as measured by material wealth. The NEP represents a directly opposite set of beliefs and preferences. In this respect, the biosphere is viewed as limited in its ability to provide resources and absorb wastes

and other impacts. The belief in the efficacy of science and technology and the consequences of a growth ethic is questioned. Changes in humankind's relationship with nature and simpler lifestyles based on quality rather than quantity are also advocated. There are three dimensions along which the two positions diverge, namely nature (the biosphere) technology, and the quality of life (Jackson, 1981).

Numerous authors have provided analogous classifications of these two essentially polar positions. For example, O'Riordan (1976) distinguished between technocentric (DSP) and ecocentric (NEP) modes of environmentalism. The technocentric mode supports material wellbeing, management of nature, centralised technological development, and defends traditional socio-economic structures. In contrast, the ecocentric mode is based on the underlying ecological principles of diversity and homeostasis. Its proponents support non-material values, reject abuse of the environment as a means for wealth production, and advocate environmentally benign technologies. These two positions have also been described as the "expansionist" and "limited world views" (M. Russell, 1979), the "cowboy" and "spaceman economies" (Boulding, 1966), the "economic-technological fix" and "neo-malthusian" positions (Sandbach, 1980), and the "technocratic" and "person-planetary" perspectives (Drengson, 1980; Roszak, 1979).

A similar set of classifications can be extended to attitudes about, evaluations of, and preferences for energy resource options. Lovins (1977) introduced the terms "hard" and "soft" energy paths. These terms refer to a complex set of assumptions and strategies related to differences in technological scale, environmental impact, the type of energy resource development desired, and the broader social goals of energy policy (Bott et al., 1983; Brooks et al., 1983; Lovins, 1977). The soft path emphasizes energy conservation and decentralized low-impact technology, and is characterized by the development of renewable energy resources (solar, wind, biomass). The hard path places an emphasis on the continuing development of non-renewable energy resources (oil, natural gas, nuclear power, oil sands and coal) and is characterized by technological sophistication and centralized development.

A similar dichotomy to environmental orientation and preference for energy resources may also be distinguished with regard to attributes of personal lifestyles. It may be assumed that any reorientation in world views would consist of a shift from a "consumer society" toward a "conserver society". The three important beliefs of a consumer or mass-consumption society are accumulation of material possessions, anthropocentrism[3], and subservience of nature (Valaskakis et al., 1979). These beliefs also reflect similar tenets of the DSP. In contrast, the conserver society (NEP) embodies a set of values, attitudes, and behaviours that reflect socially responsible consumption patterns. The literature characterizes the conserver society as one that recognizes a diversity of solutions to outstanding problems, promotes lifestyles that favour conservation, questions our ever-growing demand for consumer goods, and believes in a pricing system that reflects total social costs to society (Shapiro, 1979; Valaskakis et al., 1979). The values of a conserver society may be evident in the growth of environmentally-oriented social movements and in the burgeoning preference for "appreciative" recreation activities. A central issue of the conserver society model is the willingness of the general public to want change and adopt the appropriate lifestyles.

In recent years, various typologies and techniques have been used to describe the many different lifestyles of western society. In a review of the literature on lifestyles, Zablocki and Kantner (1976) describe lifestyles as differentiating in terms of family patterns, use of leisure time, and membership in organizations. Lifestyle may be defined as "an outward expression of our inner values; it is a form of communication with others through the foods we eat, clothing worn, cosmetics used, and choice of residence and workplaces" (Fritsch, 1979, p. 737). Lifestyle is also recognized as a holistic concept "referring to a large class of activities, preferences, interests, and opinions that are dependent on an individual's personal, social, and institutional background" (Uusitalo, 1983, p. 124).

Lifestyle research has focussed on determining and understanding "socially responsible" consumer behaviour (Anderson and Cunningham, 1972; Belch, 1979). This research is characterized by the use of Likert type scales which utilize attitudes, interests, and

[3]The notion that the world exists for our own personal benefit.

opinions as measures of lifestyle. Wells and Tigert (1971) and Plummer (1974) have demonstrated the value of considering these variable characteristics over psychographic or demographic information. In this respect, socially responsible consumption patterns have been found among consumers whose purchase decisions are based on resource-related problems and are motivated not only by a desire to satisfy personal needs, but also by a concern for the welfare of society in general (Antil and Bennet, 1979). Belch (1979) and others (Anderson and Cunningham, 1972; Uusitalo; 1983) indicate that the lifestyle of both the socially and ecologically concerned consumer is consistent with their attitudes, interests, and opinions.

A feature of our modern industrial society has been the emergence of more lifestyle variations around non-economic axes such as different attitudes, values, and beliefs (Uusitalo, 1983). For example, a recent study of "voluntary simplicity" was shown to reflect similar values and objectives of the conserver society (Elgin, 1982). Voluntary simplicity refers to lifestyles which are regarded as outwardly simple but inwardly rich. Values which are central to this lifestyle are material simplicity, human scale, ecological awareness, and personal growth. These social values possess an underlying coherence which suggest that they are not random but rather a mutually consistent and supporting set. An examination of attitudes, interests, and opinions with respect to consumer and conserver lifestyles may provide linkages with a person's environmental and energy attitude. At the very least, such an examination would identify those characteristics that differentiate lifestyle attitudes among respondents.

G. CONCEPTUAL FRAMEWORK

The above review reveals that a number of concepts are related to "world views" about energy resources, environmental attitudes, and individual lifestyles. Similarities have been drawn between the tenets of the DSP, a desire for hard energy paths, and consumer lifestyles. There is also a common thread that runs between the NEP, a desire for soft energy paths, and conserver lifestyles (i.e. voluntary simplicity). The present study involves a comparison of attitudes toward energy resources, the environment, and individual lifestyles

among the Edmonton public, Alberta environmentalists, and Alberta corporate business executives. It is expected that each group will have consistently different attitudes toward these various dimensions of the DSP and NEP. It is also expected that these attitudes will be related to preferences for energy resource options and the propensity to adopt a range of energy conservation behaviours.

Measures of environmental attitudes allow respondents to be described as either ecocentric (NEP) or technocentric (DSP). Similarly, a measure of lifestyle may help to identify people as conservers or consumers. Both of these sets of variables may be linked to measures of preference for either a soft or hard energy path and the propensity to adopt energy conservation practices. It is expected that those respondents identified as ecocentric will exhibit a tendency to adopt more energy conservation behaviours and prefer soft path energy options than those respondents identified as technocentric. It is also expected that a sample of Alberta corporate business executives will adhere to the tenets of the DSP while a sample of Alberta environmentalists will reflect attitudes consistent with the tenets of the NEP. A sample of the general public will likely generate responses that will fall somewhere between the responses of the two target groups.

More specifically, these matters will be addressed as follows in the remainder of the thesis:

1. Opinions and beliefs regarding energy conservation (Chapter 4);
2. Evaluations and preferences for energy resource options (Chapter 4);
3. Perceptions of maintaining the quality of the Alberta environment and enforcement of environmental regulations (Chapter 4).
4. Attitudes toward energy resource issues, the environment, and individual lifestyles (Chapter 5);
5. Differences regarding the relationship between environmental attitudes and preferences for energy resource options (Chapter 5);
6. Variation in reported energy conservation behaviour (Chapter 6);
7. Differences regarding the relationship between environmental attitudes and reported

— energy conservation behaviour (Chapter 6).

III. METHOD

A. COMPARATIVE RESEARCH DESIGN

The thesis represents a study of attitudes, values, and beliefs toward energy, environment, and lifestyles; it is also an examination of the linkages that may exist between these variables and behaviour. While previous studies (Farbrother, 1985; Jackson, 1985a) have examined energy-related behaviour and environmental attitudes on the basis of samples of the public only, the current study is an examination of the differences that may occur when comparing the Edmonton public with Alberta environmentalists and Alberta corporate business executives.

The thesis will therefore examine, compare, and contrast the energy preferences and energy conservation behaviours of the public with those of environmentalists and corporate business executives. This method of comparing the public with diverse interest groups follows a method used by Cotgrove (1982), who examined the extent to which the beliefs and values of the public, industrialists, trade union officials, nature conservationists, and new environmentalists diverged from each other on a variety of environmental issues. However, the present study not only considers differences in environmental attitudes but compares them to differences in opinions about energy conservation and attitudes toward energy resources and individual lifestyles. As well, the study is directed towards observing the influence of environmental attitudes on energy preferences and energy conservation behaviour in a Canadian regional context.

Alberta corporate business executives were chosen because of their expected concern with short term financial gain and emphasis on industrial expansion rather than environmental problems and energy issues. In contrast, active Alberta environmentalists were selected because of their concern for the protection and preservation of wilderness resources. The ***Alberta Wilderness Association,*** which has a membership of over 1200 people from all over Alberta, is active in lobbying government and industry for environmental and conservation reforms. Environmental issues are the fundamental lines along which these two groups are expected to

diverge, while associated issues of energy and lifestyle may also exhibit similar differences.

Differences between these two groups and a sample of the public were measured using a questionnaire (Appendix A) which was divided into five distinct sections:

1. Perceptions of conservation, energy, and environmental issues;
2. Evaluations of and preferences for energy resource options;
3. Energy conservation behaviours;
4. Attitudes toward energy, environment, and lifestyle issues;
5. Socio-economic characteristics.

B. QUESTIONNAIRE CONTENT

Perceptions of Conservation, Energy, and Environmental Issues

Ten questions dealt with perceptions of energy conservation and environmental issues. Question 1 was a simple self-comparison of conservation mindedness between respondents and their peers. Respondents were asked in Question 2: "What, if anything, would you say is the *most important* good thing that happens when energy is saved?" Respondents' perception of the supply of conventional oil resources and the future of energy prices for the next fifteen years were asked in Questions 3 and 4 respectively. Question 5 determined the importance of individual efforts to conserve energy. Respondents were asked: "How important do you feel it is that individual people like yourself make an effort to cut down on the amount of energy that they use?" Further, in Question 6, respondents were asked to explain their reason for conserving energy: "What if anything would you say is the *most important* reason for conserving energy?"

Concern about the environment was measured by asking the respondent "How concerned are you about maintaining or improving the quality of the environment in Alberta?" (Question 15), and "How do you feel about the enforcement of environmental regulations by the Government of Alberta?" (Question 16).

Pessimism or optimism for the future of the quality of life was determined by asking the respondent "What if anything do you think will happen to the general quality of life for all Albertans in the next ten years?" (Question 18). Question 20 was a self-evaluation of the level of general consumption of material goods between the respondents and their peers.

Each question was provided with a number of forced choice response categories. In Questions 2 and 6, respondents were also given the option to supply their own answer. Questions 1, 2, 5, and 6 were based on or modified from previous studies (Jackson, 1980a, 1980b), while questions 15 and 16 were based on an Environmental Council of Alberta survey (1981) of the Alberta public. Questions 3, 4, 18, and 20 were original questions written for this study.

Evaluations of and Preferences for Energy Resource Options

Five pre-coded questions were selected to measure the respondents' evaluations of, preferences for, and rationale behind the choice of preferences for future energy resource options. Question 9 was used to measure the respondents' evaluation of energy resource options. Respondents were asked "For *each* of the following, please indicate how you would rate its potential to make a major contribution to improving Canada's energy situation." Respondents were then presented with eleven energy resource options and a blank in which to specify and rate another option of their own choosing. Respondents were asked to rate each option according to whether they felt it was (1) poor, (2) fair, (3) good, (4) very good, or (5) excellent.

In Question 10 respondents were asked to select the two energy options which they felt would "...help improve Canada's energy situation *the fastest*," in the short run (the next five years). A longer term energy perspective was garnered by asking the respondent to select, in Question 12, the two energy options which they felt "Canada should "...*depend on most* to improve its energy situation" in the long run (beyond the year 2000). Questions 9, 10, and 12 were drawn from Jackson's (1985a) study, and were originally derived from a survey sponsored by the Union Carbide Corporation (1980).

Questions 11 and 13 were used to examine the rationale behind the choice of preferred energy resource options in both the short and long run. Respondents were asked to choose the "...*most important* reason for your choice of the best energy option in the short run" (Question 11), and "...in the long run" (Question 13). Each question was provided with the following six response categories:

1. There are no other alternatives;
2. It has the advantage of creating more jobs;
3. Its environmental effects are less than those of other options;
4. It will stimulate more growth in the economy;
5. It will diversify Canada's energy resource base;
6. Other (Please specify).

These two questions represent an examination of some of the underlying reasons behind the respondents' choice of energy resource options in both the short and long run. While differences in preference among the public have been shown to exist (Farbrother, 1985; Jackson, 1985a, 1985b), there has not been any attempt to investigate empirically the rationale behind these choices.

Energy Conservation Behaviours

While it would have been desirable to measure respondents' actual energy conservation behaviour, this would have been beyond the limitations and scope of this thesis. An efficient and effective method for obtaining measures of behaviour was obtained by asking the respondent simply to report on his or her energy conservation behaviour. Respondents were initially asked "Have you made any effort to reduce the amount of energy that you use?" (Question 7). Respondents were then asked to "Please list what you have done to conserve energy or promote energy conservation" (Question 8). An open-ended question format was used as it was anticipated that more than fifty different energy conservation behaviours would be reported, based on Farbrother's (1985) experience.

Attitude Scales

Three attitude scales were developed by examining some two hundred statements from the literature on issues regarding the environment, energy resources, and lifestyle issues. Statements were selected for their ability to tap the three underlying dimensions (nature, technology, and the quality of life) which Jackson (1983) has argued are characteristic of attitudes consistent with either the ecocentric or technocentric modes. Statements used by Dunlap and Van Liere (1978, 1984) were included for comparability. Thirteen energy and twenty-three environmental statements were finally selected to construct two of the attitude scales. Some statements retained their form exactly as in previous research papers; others were modified or created to reflect the Canadian scene and current levels of economic activity.

The lifestyle attitude scale was developed on the basis of an examination of the literature on lifestyle activities, interests, and opinions (Elgin, 1982; Elgin and Mitchell, 1977; Plummer, 1974). The statements for this attitude scale were selected on the basis that they may tap some of the underlying dimensions of lifestyle. In part, they included spending habits, materialism, recreation, and lifestyle satisfaction. Twenty-nine statements were selected to represent these dimensions of lifestyle.

The measurement of attitudes was based on the variation in responses along a five-point Likert scale. Respondents were asked to circle a number which indicated their level of agreement or disagreement with the statement. Five response categories were available for each statement: Strongly agree = 1, agree = 2, neutral = 3, disagree = 4, and strongly disagree = 5.

Socio-economic Characteristics

The final portion of the questionnaire requested a few facts regarding the socio-economic characteristics of the respondent. In this section, five questions were asked of the respondent: the respondents' sex, household population, age, level of education achieved, and total annual income of the entire household. Pre-coded response categories were presented to respondents to indicate their particular socio-economic characteristics.

C. QUESTIONNAIRE DESIGN

The design of the questionnaire followed the principles of the Total Design Method (Dillman, 1978). The presentation of the questions and statements was designed to produce a document that was concise and easily understood by the respondent. For example, instructions were capitalized, commands were underlined, and the emphasis on certain key words was illustrated by changing the font.

The questionnaire, in the form of a small booklet (16 x 21.5 cm), was produced using the University of Alberta textform word processing program. This format gave the document a professional appearance to demonstrate the seriousness of the study. The questionnaire appearance may have encouraged its completion by respondents and may have contributed to an enhancement of the response rate.

Sensitive questions regarding socio-demographic status were placed at the end of the questionnaire as it was felt respondents would be willing to complete them having gone thus far. An emphasis was placed on the confidential nature of the document to encourage the respondent to complete the questionnaire. It was stated that the answers to personal socio-economic questions would be used for classification purposes only. Respondents were also provided with room on the last page of the questionnaire to make additional comments.

The Pretest

The questionnaire was pretested before being finalized for distribution. Several work colleagues (Edmonton Parks and Recreation), fellow graduate students, and professors from the Departments of Geography, Sociology, and Economics were selected to identify problems with questionnaire design, format, and wording of the questionnaire. Their familiarity with either the research subject or design of questionnaires allowed for valuable suggestions. All comments were considered and subsequent alterations were made to the design of the questionnaire.

D. PUBLIC AND TARGET GROUP SAMPLE SELECTION

The public portion of the survey was conducted in the City of Edmonton. Financial limitations and time constraints precluded the sampling of the public in other cities or in rural areas. A random sample of the total City of Edmonton population was drawn from the 1983 Edmonton census. Magnetically encoded tapes of the entire census were made available by the Population Research Laboratory at the University of Alberta. The sample drawn from these tapes provided the enumeration district number and the area number from which the potential respondent could be found. By sorting the district and area numbers in descending order the survey could proceed in an orderly fashion. Three hundred household addresses were selected from a population of 560,085 residents (Alberta Municipal Affairs, 1985).

The two target group survey samples were selected from different sources. A random sample of corporate business executives was drawn from a recent listing of successful and established leaders in their field (*Who's Who in Business, Finance, and Government in Alberta,* 1983). A random sample of Alberta environmentalists was drawn from the mailing list of the *Alberta Wilderness Association* (March 1985). A sample size of 150 members from each group were selected to participate in this survey.

E. SURVEY ADMINISTRATION

Two distinct methods were used for obtaining responses from the public and the two target groups. The Edmonton public was surveyed using a hand-delivered self-administered questionnaire. The same questionnaire was also mailed to Alberta environmentalists and Alberta corporate business executives.

The public portion of the survey was conducted by a methodical use of the census map in order to cover the entire metropolitan area of the city of Edmonton. The research assistant hired to deliver and retrieve these questionnaires was given a set procedure to follow in order to ensure a high response rate. If a respondent was absent, or refused to accept the questionnaire, it was delivered to the household on the immediate right or, if necessary, to the household on the immediate left of the household originally selected. The rationale and

purpose of the survey were explained to the potential respondent together with an emphasis on confidentiality.

The questionnaires were delivered to the selected Edmonton households during a six week period in March and April, 1985. The delivery of the questionnaire took place on weekday evenings and all day on weekends. This method was used to avoid the problem of missing potential respondents who would be absent during the normal work day of 9 to 5 p.m. Upon accepting the questionnaire, respondents were then requested to leave the completed questionnaire where it could be collected later. If this was not possible, arrangements were made to collect it from them at a convenient time. For example, respondents living in high-rise dwellings were found to be difficult to contact in the beginning of the survey. This was partly resolved by a preliminary phone call to the potential respondent, using the reverse phone directory.

The method of obtaining responses from the two target groups was through a mailout of the same self-administered questionnaire. The mailout package included the questionnaire with a letter of introduction (Appendix B) and a self-addressed stamped return envelope. The mailout was conducted on March 20. At one week intervals after the initial mailout, two reminder postcards were sent to all 300 potential respondents (Appendix C).

Response Rates

From the 300 potential respondents in the Edmonton area public survey, 223 questionnaires were returned. However, four questionnaires were found to be incomplete and were therefore removed, while three questionnaires were undeliverable. This left 216 usable questionnaires for an effective response rate of 72%. Problems encountered during the administration of the questionnaire included language communication difficulties and dwellings replaced by businesses (e.g. bank) or other establishments (e.g. old age home). In some instances there was a lack of interest in the subject matter.

The return by mail of completed questionnaires from the two other groups varied considerably. The post office returned as undeliverable nine questionnaire packages from the

corporate business group and five questionnaire packages from the environmental group. From an effective sample of 141 and 145 potential respondents from each group, completed questionnaires were returned by 75 and 110 respectively. Accordingly, the total response rate from the corporate business group was 53% and from the environmental group 76%.

The reminder postcards definitely enhanced the number of completed questionnaires returned by mail over the months of March and April, 1985. The first reminder postcard increased the rate of return from 31% to 45% among corporate business executives and from 45% to 62% among environmentalists. The second and final reminder further increased the rate of return from both groups. In this case, the rate of increase from corporate business executives was 8 percentage points and from environmentalists 14 percentage points.

Data Analysis

The questionnaire was designed, in part, to simplify the process of coding the data. Each response category had a predetermined number that served as a response code. The data from each questionnaire were entered on to coding sheets for a permanent record. All of the coding was performed by the researcher following a pre-designed coding manual. This coded information was then entered into a data file on the computer. Analysis of the frequency tabulations in a disaggregated form allowed corrections to be made to the raw data. Subsequent analysis required the data in some categories to be collapsed. Aggregate categories in some of the questions were necessary to make the interpretation of the results more efficient.

The statistical procedures used in the following chapters include frequency distributions, crosstabulation, and analysis of variance. During the analysis, the 0.05 level was used to determine the significance of associations between variables.

IV. ENVIRONMENTALIST, PUBLIC, AND CORPORATE BUSINESS EXECUTIVE VIEWS OF ENERGY CONSERVATION, ENERGY OPTIONS, AND THE ENVIRONMENT

A. INTRODUCTION

The nature of this study requires a comparison of the two target groups (environmentalists, corporate business executives) with the general public sample. This chapter is an analysis of differences among the groups with reference to:

1. Perceptions of energy conservation (Q-1 to Q-6)
2. Evaluations of and preferences for energy options (Q-9 to Q-13)
3. Perceptions of the environment in Alberta (Q-15 and Q-16)
4. Socio-economic data (Q-21 to Q-25).

B. PERCEPTIONS OF ENERGY CONSERVATION

The data derived from Question 1 of the questionnaire deal with respondents' evaluation of their own level of "conservation-mindedness." The results indicate that environmentalists (84.9%) were almost twice as conservation-minded as both the public (44.4%) and corporate business executives (47.3%) (Table 4.1). Because only a small percentage of the respondents from each sample described themselves as "less conservation-minded", this category was collapsed into "the same" category to reduce data fragmentation. Slightly more than half of the public and the business executive sample regarded themselves as "the same" or "less conservation minded" than their peers, compared with only 15.1% of the environmentalists.

In Question 2, the respondents were asked: "What, if anything, would you say is the *most important* good thing that happens when energy is saved?" The results from this question indicate a difference in the perceived benefits of energy conservation (Table 4.1). Of the four available answers, the statement "more energy available for the future" garnered the single largest response from both the public (47.5%) and business executives (66.2%). In contrast, fewer environmentalists (31.0%) agreed with this statement. However, the response to the

TABLE 4.1
PERCEPTIONS OF ENERGY CONSERVATION AND ENERGY EXPECTATIONS AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Perceptions of Energy Conservation	Environmentalist Sample %	Public Sample %	Business Sample %
Conservation Self-Evaluation			
More conservation minded	84.9	44.4	47.3
Less or the same	15.1	55.6	52.7
Totals (n)	(106)	(214)	(74)
Chi-square = 49.87; d.f. = 2; p<.0001			
Importance of Energy Savings			
Energy for the future	31.0	47.5	66.2
Energy costs reduced	4.0	17.6	8.5
Oil imports reduced	5.0	5.4	14.1
Less environmental damage	60.0	29.4	11.3
Totals (n)	(100)	(204)	(71)
Chi-square = 60.61; d.f. = 6; p<.0001			
Oil Supply Expectations			
Major problem	57.8	27.4	33.3
Minor or no problem	42.2	72.6	66.7
Totals (n)	(102)	(212)	(75)
Chi-square = 28.01; d.f. = 2; p<.0001			

statement "less pollution and environmental damage" was greatest among environmentalists (60.0%) compared with 29.4% of the public and only 11.3% of the business executives. These two statements illustrate some of the differences in perception between environmentalists and business executives regarding the importance of saving energy. The public and corporate business executives are concerned with the supply aspect of conservation, whereas environmentalists tend to emphasize the environmental benefits.

Question 3 was used to determine perceptions of world oil supplies. Respondents were asked: "Do you expect the supply of conventional oil resources to be a problem *for the world as a whole* in the next twenty-five years"? From the three available answers to this question, it was found that environmentalists differed widely from the public and business executives in their perception of future oil supplies (Table 4.1). Environmentalists (42.2%) were not in agreement with the public (72.6%) or with business executives (66.7%) in their evaluation of

world oil supplies as either a "minor supply problem" or "no problem at all". Instead, many environmentalists (57.8%) expected oil supplies, over this same period, to be a "major supply problem".

Question 4 dealt with expectations "regarding the future of energy prices for the next 15 years". Results indicate a high amount of agreement among respondents from all three groups on the future of energy prices (Table 4.2): 93.8% of the environmentalists, 88.5% of the public, and 87.5% of business executives believed that "energy prices will go up". In spite of recent trends which indicate a surplus of oil in world markets, none of the three groups was optimistic that energy costs will be reduced.

TABLE 4.2
PERCEPTIONS OF ENERGY PRICES AND ENERGY CONSERVATION AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Perceptions of Energy Conservation	Environmentalist Sample %	Public Sample %	Business Sample %
Energy Price Expectations			
Price to go up	93.8	88.5	87.5
Remain the same	6.2	11.5	12.5
Totals (n)	(97)	(174)	(64)
Chi-square = 2.40; d.f. = 2; (n.s.)			
Importance of Conservation			
Somewhat important	25.5	49.8	54.7
Very important	74.5	50.2	45.3
Totals (n)	(106)	(215)	(75)
Chi-square = 21.11; d.f. = 2; $p<.0001$			
Rationale to Conserve Energy			
Saves money	17.6	27.8	35.1
Moral to do so	18.6	12.4	17.6
Avoid future shortages	18.6	35.9	39.2
Less environmental impacts	45.1	23.9	8.1
Totals (n)	(102)	(209)	(74)
Chi-square = 38.53; d.f. = 6; $p<.0001$			

To determine the perceived importance of conservation, respondents were asked in Question 5: "How important do you feel it is that individual people like yourself make an

effort to cut down on the amount of energy that they use?" The results from this question indicate differences in the perceived importance of energy conservation (Table 4.2). From the four available "importance" responses, 74.5% of the environmentalist sample felt that individual efforts to conserve energy were "very important". Half of the public sample (50.2%) and slightly less than half of the business executive sample (45.3%) considered individual efforts to conserve energy as "very important."

Some of the underlying reasons why people feel conservation of energy to be important were examined in Question 6. Respondents were asked: "What, if anything, is the *most important* reason for conserving energy?" Large differences in the choice of reasons behind energy conservation were found among respondents (Table 4.2). A large proportion of the public sample (35.9%) and of the business executive sample (38.7%) chose the answer "to help avoid future shortages" as the most important reason for conserving energy. The answer "to save money" was also fairly popular among the public (27.8%) and among the business executive sample (35.1%). Environmentalists, however, had a low and equal response to the three answers "to save money" (17.6%), "moral to do so" (18.6%), and "to avoid future shortages" (18.6%). In contrast, a large proportion of the environmentalist sample (45.1%) chose the answer "to reduce impacts on the environment" as the most important reason for conserving energy. This selection represents almost twice the proportion of the public sample (23.6%) and over five times the proportion of the business executive sample (8.0%) that chose this response as a reason for conserving energy.

The preceding results reveal that there were significant and consistent differences among the three sample groups in their perceptions of energy conservation, energy supply, and the rationale for conserving energy. (Differences between the groups were not significant for the question dealing with energy prices.) Overall, environmentalists believed themselves to be more conservation-minded, stressed individual efforts to conserve energy, and emphasized the environmental benefits of doing so. In contrast, corporate business executives were less convinced of the importance of conservation. They believed that the importance of energy saving is energy availablity for the future and the rationale for doing so is to avoid future

shortages and to save money. With the exception of Questions 1 and 3, the responses of the public sample assumed an intermediate position between environmentalists and corporate business executives.

C. ENERGY RESOURCE EVALUATIONS

Evaluations of some of the energy options available to Canada were examined in Question 9. Respondents were asked to evaluate energy options by rating their potential to improve Canada's energy resource situation. Eleven individual energy options were presented to be rated as poor, fair, good, very good, or excellent. The degree of support for each energy option was measured by the mean-scores obtained from each frequency distribution, while differences among the three sample groups were tested by an analysis of variance (Table 4.3).

Results indicate that there were differences among the three groups with respect to their evaluations of all energy options, with the exception of prairie coal. Environmentalists gave a consistently higher evaluation than the public and business executives to conserving energy, solar energy, and wind energy. Conversely, environmentalists gave a consistently lower evaluation than the public and business executives for mountain coal, conventional oil, offshore oil sources, nuclear energy, oil from tar sands, natural gas, and hydro-electric power. These results are consistent with the expectation that environmentalists would give a higher evaluation of soft path options than of hard path options.

Corporate business executives, on the other hand, gave a consistently higher evaluation for most non-renewable energy options than either environmentalists or the public. These included natural gas, oil from tar sands, nuclear energy, conventional oil, and mountain coal. In contrast, business executives gave a consistently lower evaluation than both environmentalists and the public for conserving energy, solar energy and wind energy. These results are consistent with the expectation that business executives would give a higher evaluation of hard path options rather than soft path options. As expected, the public assesed energy options in a manner that was between those given by environmentalists and business executives, with the exception of offshore oil sources and hydro-electric power.

TABLE 4.3
EVALUATIONS OF RESOURCES THAT WOULD IMPROVE CANADA'S ENERGY SITUATION AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Energy Resource Options	Environmentalist Sample Mean	Public Sample Mean	Business Sample Mean	F	p<
Prairie Coal	2.51	2.55	2.71	00.73	n.s.
Mountain Coal	2.19	2.61	3.04	12.70	.0001
Conventional Oil	2.78	3.32	3.47	15.14	.0001
Offshore Oil Sources	2.77	3.12	2.82	04.52	.0115
Conserving Energy	3.92	3.39	3.29	10.07	.0001
Solar Energy	3.52	3.33	2.45	17.47	.0001
Nuclear Energy	1.87	2.22	2.95	15.71	.0001
Oil from Tar Sands	3.20	3.29	3.78	07.17	.0009
Natural Gas	3.59	3.66	4.22	10.13	.0001
Hydro-Electric Power	2.98	3.43	3.20	06.34	.0020
Wind Energy	3.15	2.63	2.05	15.07	.0001

Large differences among the three groups occurred in their evaluations of conventional oil and wind energy, but even moreso with regard to nuclear and solar energy. Environmentalists and the public evaluated solar energy from good to very good and nuclear energy from poor to good. This is in contrast to corporate business executives who evaluated nuclear energy from good to very good and solar energy from fair to good.

D. PREFERENCES FOR ENERGY RESOURCE OPTIONS

Short Run Preferences

In Question 10, respondents were asked to select, from the previous list of potential energy sources, the best option which in the short run (the next 5 years), they believed would help to improve Canada's energy situation the fastest. Environmentalist, public, and business executive support for the most preferred short run option is presented in Table 4.4.

A difference in preferences for short run options occurred among the three groups. There were, however, few respondents that indicated a short run preference for hydro-electric power, prairie and mountain coal. None of the respondents from the three groups chose wind energy as a short run preference. The greatest differences occurred among preferences for

TABLE 4.4
PREFERENCES FOR SHORT RUN ENERGY OPTIONS AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Best Short Run Option	Environmentalist Sample		Public Sample		Business Sample	
	%	Rank	%	Rank	%	Rank
Prairie Coal	0.9	8	5.0	8	0.0	0
Mountain Coal	1.0	9	1.5	10	0.0	0
Conventional Oil	16.5	3	16.4	2	39.2	1
Offshore Oil	9.7	4	9.5	6	2.7	5
Conserving Energy	39.8	1	14.4	4	13.5	3
Solar Energy	7.8	5	12.4	5	1.4	6
Nuclear Energy	0.0	0	5.5	7	0.0	0
Oil From Tar Sands	5.8	6	16.3	3	12.2	4
Natural Gas	16.6	2	16.9	1	31.1	2
Hydro-Electric Power	1.9	7	2.0	9	0.0	0
Totals (n)	(201)		(103)		(74)	

Chi-square = 80.01; d.f. = 18; $p < .0001$

conventional oil, offshore oil, conserving energy, oil from tar sands, and natural gas.

Corporate business executives supported both conventional oil (39.2%) and natural gas (31.1%) as short run options more frequently than environmentalists (16.5% and 16.6% respectively) and the public (16.4% and 16.9% respectively). Conversely, environmentalists advocated energy conservation in the short run more frequently (39.8%) than the public (14.4%) or business executives (13.5%). The short run preferences for these three particular options are in the expected direction. Environmentalists preferred energy conservation (soft path), business executives preferred established energy sources (hard path), while the percentage of the public that preferred these options was between the two target groups.

However, the expected consistency in direction did not occur among short run preferences for offshore oil, solar energy, nuclear energy, and oil from tar sands. Both environmentalists (9.7%) and the public (9.5%) supported offshore oil as a short run option more frequently than business executives (2.7%). The public more frequently preferred oil from tar sands (16.3%) and solar energy (12.4%) as short run options than either environmentalists (5.8% and 7.8% respectively) or business executives (12.2% and 1.4% respectively). No environmentalists or business executive supported nuclear energy as a short

run option, while a small percentage of the public (5.5%) did.

Overall, environmentalists were largely in favour of conserving energy; the public preferred a wide range of fossil fuels; and corporate business executives advocated the continued use of conventional fuels over the short run. Overall support for natural gas and conventional oil among the three groups is not surprising considering the large reserves of these resources in Alberta.

Long Run Preferences

In Question 12, respondents were asked to select from the same list the option which Canada should depend on most to improve its energy situation in the long run (beyond the year 2000). The results are presented in Table 4.5.

A significant difference in preferences occurred among the three groups with respect to all long run options. Few respondents indicated a preference for wind energy, prairie coal or mountain coal over the long run. The greatest difference in preferences occurred with respect to offshore oil, energy conservation, solar energy, nuclear energy, oil from tar sands, and natural gas.

Environmentalists supported energy conservation (39.2%) as a long run option more frequently than either the public (10.6%) or business executives (6.7%). Conversely, corporate business executives advocated oil from tar sands (25.7%) and nuclear energy (17.6%) as long run options more frequently than environmentalists (10.8% and 2.9% respectively) and the public (8.1% and 14.1% respectively). Similarly, business executives more frequently advocated natural gas (16.2%) and offshore oil (9.6%) as long run options than either environmentalists (3.8% and 2.1% respectively) or the public (6.6% and 6.1% respectively).

The expected differences in direction occurred among the three groups with respect to long run preferences for energy conservation, nuclear energy, offshore oil, natural gas, prairie and mountain coal. Environmentalists preferred energy conservation (soft path), business executives favoured conventional fossil fuels and nuclear energy (hard path), while the percentage of the public that preferred these options was between the two target groups.

The expected consistency in direction did not occur among long run preferences for solar energy, hydro-electric power, conventional oil, and wind energy. The public (38.9%) supported solar energy as a long run option slightly more frequently than environmentalists (30.0%) and four times more frequently than business executives (9.5%). The public gave a greater amount of support for conventional oil (3.5%) and hydro-electric power (7.1%) as long run options than either environmentalists (0.0% and 3.9% respectively) or business executives (1.4% and 6.8% respectively). The low amount of support for conventional oil, among the three groups, possibly indicates a greater acceptance of the limits to this energy option.

TABLE 4.5
PREFERENCES FOR LONG RUN ENERGY OPTIONS AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Best Long Run Option	Environmentalist Sample		Public Sample		Business Sample	
	%	Rank	%	Rank	%	Rank
Prairie Coal	2.0	9	2.1	9	2.7	8
Mountain Coal	1.9	10	2.0	10	2.6	9
Conventional Oil	0.0	11	3.5	8	1.4	10
Offshore Oil	2.1	8	6.1	7	9.6	4
Conserving Energy	39.2	1	10.6	3	6.7	7
Solar Energy	30.0	2	38.9	1	9.5	5
Nuclear Energy	2.9	7	14.1	2	17.6	2
Oil From Tar Sands	10.8	3	8.1	4	25.7	1
Natural Gas	3.8	5	6.6	6	16.2	3
Hydro-Electric Power	3.9	4	7.1	5	6.8	6
Wind Energy	3.0	6	1.0	11	1.3	11
Totals (n)	(102)		(198)		(74)	

Chi-square = 97.03; d.f. = 20; $p<.0001$

In summary, environmentalists, when compared to business executives, were largely in favour of energy conservation and solar energy (soft path) over the long run, while the public largely preferred solar energy and had some support for nuclear energy and energy conservation. This represents a somewhat mixed preference, among the public, for both soft and hard path options over the long run. In comparison to these two groups, corporate business executives remained largely in favour of fossil fuels (other than conventional oil) and

nuclear energy (hard path) over the long run. It is now essential to examine the rationale behind these short and long run energy preferences. The choice of rationale may help to explain the apparent differences in choice among the three groups.

Rationale Behind Preferences For Energy Options

Respondents were asked, in Questions 11 and 13, for the reason behind their choice of the best energy option in both the short and the long run. Respondents could choose from five pre-selected statements or they could specify their own reason in the space provided. The results are presented in Table 4.6.

TABLE 4.6
THE RATIONALE FOR THE BEST ENERGY OPTIONS CHOSEN IN THE SHORT RUN BY ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Short Run Reason	Environmentalist Sample %	Public Sample %	Business Sample %
There are no other alternatives	17.5	8.5	23.3
Has advantage of creating more jobs	2.9	15.6	6.8
Less environmental effects than other options	41.7	27.6	12.3
More growth in the economy	9.7	21.1	27.4
Diversify Canada's resource base	7.8	15.6	9.6
Other Reasons specified by respondents	20.4	11.6	20.5
Totals (n)	(103)	(199)	(73)

Chi-square = 50.72; d.f. = 10; $p<.0001$

A large proportion of environmentalists (41.7%) and much of the public (27.6%) perceived their choice of the best short run option as having "fewer environmental effects than other options." In contrast, fewer corporate business executives (12.3%) selected this reason. They were more frequently in agreement with the statement that their choice of energy options would "stimulate more growth in the economy" over the short run (27.4%). While a large proportion of the public (21.1%) also agreed with this statement, fewer

environmentalists (9.7%) indicated this reason for their choice of short run options. These reasons stand out as the two main indicators which differentiate environmentalists from business executives in their selection of short run preferences.

Over the long run (Table 4.7), environmentalists (62.5%) and the public (39.9%) perceived their selection of energy resource options to have "fewer environmental effects than other options". In comparison, very few business executives (16.2%) perceived their selection of long run energy options to have the same effect. Instead, many business executives (28.4%) and much of the public (24.4%) perceived that their selection of long run energy options would "diversify Canada's energy resource base". Only 10.6% of environmentalists were in agreement with this statement.

TABLE 4.7
THE RATIONALE FOR THE BEST ENERGY OPTIONS CHOSEN IN THE LONG RUN BY ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Long Run Reasons	Environmentalist Sample %	Public Sample %	Business Sample %
There are no other other alternatives	9.6	10.9	13.5
Has advantage of creating more jobs	1.9	7.3	4.1
Less environmental effects than other options	62.5	39.9	16.2
More growth in the economy	2.9	8.8	10.8
Diversify Canada's resource base	10.6	24.4	28.4
Other reasons specified by respondent	12.5	8.8	27.0
Totals (n)	(104)	(193)	(74)

Chi-square = 53.05; d.f. = 10; $p<.0001$

The majority of business executives who answered the open-ended response category (27.0%) indicated that supplies of oil based reserves would manage to keep pace with energy demand or expressed confidence in the ability of technology to fulfill any energy needs. Other responses from environmentalists (12.5%) and the public (8.8%) to this open-ended category did not differentiate well enough to warrant further analysis.

There was a noticeable change, among the three groups, for the rationale behind the respondents' choice of options from the short to the long run. The change in the perception that their choice of options will have "fewer environmental effects than those of other options" was from 41.7% to 62.5% among environmentalists and from 27.6% to 39.9% among the public. Among corporate business executives the change in this perception was much less (from 12.3% to 16.2%). The greatest change among corporate business executives, however, was in the perception that their choice of energy options will "diversify Canada's energy resource base" (from 9.6% to 28.4%). Among all three sample groups there was a decline in the perception that their choice of energy option "will stimulate more growth in the economy". Support for this statement fell from 9.7% to 2.9% among environmentalists, from 21.1% to 8.8% among the public, and from 27.4% to 10.8% among corporate business executives.

Preferences for Hard and Soft Path Energy Options

For the purpose of analysis previous research on energy preferences has adopted a method of classifying energy options into hard and soft path categories (Jackson, 1985a, 1985b, 1985c; Farbrother 1985). In this analysis of energy preferences the eleven energy options were also classified into the hard versus soft path dichotomy. However, rather than to merely repeat the same classification process as was used in previous research, it is useful to consider the respondents' perceptions of the energy options before classifying them into the two categories.

In a recent study, Jackson (1985a) considered three options to be consistent with the soft path (conservation, solar energy, and wind energy) and six options to be consistent with the hard path (hydro-electricity, nuclear power, natural gas, conventional oil, oil from tar sands, and coal). Similarly, Farbrother (1985) classified options in the following manner: soft path (conserving energy, solar energy, and biomass fuels) and hard path (oil and natural gas, oil from tar sands, coal, and nuclear power). The main problem, however, was with hydro-electric power, which was classified as a hard path option in the first study and

removed from analysis in the latter study.

The problem of defining hydro-electric power as a soft or hard path energy option was resolved by the further examination of the results from Questions 11 and 13. From a crosstabulation analysis of the six possible reasons for the choice behind the most preferred short and long run energy options, it was found that, regardless of affiliation, greater than 50% of all respondents who chose hydro-electric power did so because it was perceived to have "environmental effects less than those of other options." Therefore, on the basis of the respondents' perceptions of hydro-electric power, this energy option was categorized as a soft path energy option.

As a result, the energy options were collapsed into two groups, namely:

1. Soft path energy options: solar energy, conserving energy, wind energy, and hydro-electric power.
2. Hard path energy options: prairie and mountain coal, offshore oil, natural gas, oil from tar sands, conventional oil, and nuclear energy.

There were significant relationships between respondents' affiliation and preference for soft and hard path energy options in both the short and long run (Table 4.8). Over the short run, half of the environmentalists (49.5%) indicated a preference for soft path energy options. This was considerably more than the frequency of corporate business executives (14.9%) and the public (28.9%) that chose these energy options. There was, however, considerable support for hard path options among business executives (85.1%) and among the public (71.1%). Only half of the environmentalist sample (50.5%) favoured a hard path over this same period of time.

The gap between environmentalists and corporate business executives was even greater in the long run than in the short run. Over the long run, environmentalists (76.5%) and the public (57.6%) chose soft path options much more frequently than corporate business executives (24.3%). In contrast, the preference for hard path options was much higher among business executives (75.7%) than it was among the public (42.5%) or among environmentalists (23.5%).

TABLE 4.8
SOFT AND HARD PATH ENERGY PREFERENCES OVER THE SHORT AND LONG RUN AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Preferences	Environmentalist Sample %	Public Sample %	Business Sample %
Short Run			
Soft Path	49.5	28.9	14.9
Hard Path	50.5	71.1	85.1
Totals (n)	(103)	(201)	(74)
Chi-square = 25.52; d.f. = 2; $p<.0001$			
Preferences	**Environmentalist Sample %**	**Public Sample %**	**Business Sample %**
Long Run			
Soft Path	76.5	57.6	24.3
Hard Path	23.5	42.5	75.7
Totals (n)	(102)	(198)	(74)
Chi-square = 47.7; d.f. = 2; $p<.0001$			

Among all three groups there was an increase in the frequency of respondents that preferred soft path energy options from the short to the long run. The greatest increase in the preference for soft path energy options was among the public (up 29 percentage points) and among environmentalists (up 26 percentage points). The increase in soft path energy preference was much less apparent among business executives (up 9 percentage points).

As longer time horizons were conceived, the shift in respondent preference from hard path to soft path energy options is indicated. This finding supports the result obtained in a previous analysis of preferences in an earlier section of this chapter (Table 4.4 and 4.5). That analysis also indicates the tendency for all three sample groups to increase their preference for some soft path alternatives such as solar energy from the short to the long run. As well, energy preferences among the public suggest a desire for soft path options over this same period of time. This particular result is consistent with results obtained in other studies of energy preference (Brady, 1980; Farbrother, 1985; Farhar et al., 1980; Jackson, 1985a).

Rationale Behind Hard and Soft Path Energy Options

Results from Question 11 and 13 have indicated a difference among respondents in the reasons behind their choice of short and long run energy preferences. The analysis revealed the greatest differences in rationale to be among preferences for long run energy options. The following analysis will, therefore, pertain only to the respondents' rationale for energy preferences over the long run (Table 4.9).

TABLE 4.9
THE RATIONALE FOR HARD AND SOFT PATH ENERGY PREFERENCES OVER THE LONG RUN AMONG ALL RESPONDENTS

Rationale	Hard Path Options %	Soft Path Options %
There are no other alternatives	13.0	9.3
Has advantage of creating more jobs	8.8	2.0
Less environmental effects than other options	16.3	60.8
More growth in the economy	15.0	2.0
Diversify Canada's resource base	27.5	16.7
Other reasons specified by respondent	18.8	9.3
Totals (n)	(285)	(208)

Chi-square = 83.74; d.f. = 5; $p<.0001$

There were significant relationships between a respondent's choice of soft or hard path energy options and the respondent's reasons for this choice. Few respondents that favoured either hard path options (8.8%) or soft path options (2.0%) perceived their choices to have the "advantage of creating more jobs." Of the respondents who chose hard path options, 27.5% perceived these options to "diversify Canada's resource base," and 15.0% perceived these options to "stimulate more growth in the economy." Few respondents that were in favour of soft path options chose these reasons (16.7% and 2.0% respectively). In contrast, greater than 60.8% of those that favoured soft path energy options perceived their choices to have "less environmental effects than those of other options" compared to to only

16.3% of those that chose hard path energy options.

There is a clear indication of a predominantly environmental rationale behind respondents who chose soft path energy options. In contrast, respondents who chose hard path energy options supported a variety of different reasons, of which environmental effects were not the most important.

E. PERCEPTIONS OF THE ENVIRONMENT IN ALBERTA

Public concern about the environment in Alberta was examined in a survey by the Environmental Council of Alberta in 1981. The present survey replicates two of the questions from that survey. Because differences in energy preferences existed among the three sample groups, it may also be expected that differences in concern for the Alberta environment would also exist. In this respect, concern was expected to be highest among environmentalists, lowest among corporate business executives, and relatively neutral among the public.

Respondents were asked in Question 15: "How concerned are you about maintaining or improving the quality of the environment in Alberta?" The results from a comparison of frequencies (Table 4.10) indicate that environmentalists tended to be "very concerned" (83.0%) with the environment, while only 34.1% of the public and 24.0% of the corporate business executives exhibited this same level of concern. However, 56.7% of the public and 64.0% of the business executives were "moderately concerned" compared to 15.1% of the environmentalists. The percentage of respondents that were "not very concerned" and "not at all concerned" with the environment was much greater among the public (9.1%) and corporate business executives (11.7%) than it was among environmentalists (1.9%).

Question 16 asked the respondents: "How do you feel about the enforcement of environmental regulations by the government of Alberta"? A comparison of frequencies indicated differences among the three groups (Table 4.10). Of the business executives, 66.2% felt the enforcement of environmental regulations to be "about right"; 22.8% of the public and only 6.6% of the environmentalists felt the same way. Conversely, a much larger proportion of the public (61.7%) and especially environmentalists (93.4%) felt that

TABLE 4.10
CONCERN FOR THE ENVIRONMENT AND ENVIRONMENTAL REGULATION ENFORCEMENT AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

	Environmentalist Sample %	Public Sample %	Business Sample %
Concern for the Environment			
Very concerned	83.0	34.1	24.0
Moderately concerned	15.1	56.7	64.0
Not very and not concerned	1.9	9.1	11.7
Totals (n)	(106)	(208)	(74)

Chi-square = 84.35; d.f. = 4; $p<.0001$

	Environmentalist Sample %	Public Sample %	Business Sample %
Enforcement of Environmental Regulations			
Too tough	0.0	1.9	9.5
About right	6.6	22.0	66.2
Not tough enough	93.4	61.7	16.2
Don't know/No opinion	0.0	14.4	8.1
Totals (n)	(106)	(209)	(74)

Chi-square = 135.10; d.f. = 6; $p<.0001$

environmental regulations were "not tough enough". Few business executives (16.2%) felt the same way.

The results suggest that perceptions of the environment differ greatly in Alberta. Concern for the environment and opinions about the enforcement of environmental regulations illustrate only some of the differences between environmentalists and corporate business executives on environmental matters. As with preferences for energy options, these differences are consistent and in the direction expected.

F. SOCIO-ECONOMIC COMPARISONS

In a comparison of socio-demographic data among environmentalists and the public, Cotgrove (1982, p. 137) found that environmentalists were generally younger and had an average income higher than among the public. The following discussion supports this

contention and examines other differences and similarities in the socio-demographic characteristics of the three sample groups. The results from this analysis are presented in Table 4.13.

While a few more females than males responded to the public survey, the mailout of the questionnaire to the two target groups produced a largely male response. Of these respondents, 78.3% of the environmental sample and 96% of the business executive sample were male. Among the public, 46.2% of the respondents were male.

In a comparison of household size, a large proportion of the environmentalist sample (39.6%) had two rather than three or more persons in their household. A household size of four or more was found among 37.5% of the public sample and 41.3% of the business executive sample. The difference in household size among the three sample groups may be attributed to the difference in other factors such as age. For this reason, household size will not be considered in any subsequent analysis.

While there was a fairly large number of persons between the ages of 26-35 among the public (38.6%) and the environmentalists (46.2%), there were very few corporate business executives (6.7%) in this same age cohort. However, to become a well established business executive and to wield enough influence to be listed in the *Whos' Who in Government, Finance, and Business in Alberta* (1983) requires years of experience and a large proportion of the corporate business executives (74.4%) were over age 45.

A comparison of education levels attained showed the public to be fairly well distributed across the three education categories. In contrast, environmentalists (79.2%) and corporate business executives (77.3%) were predominantly university educated.

The income characteristics of the three sample groups varied widely. For example, 93.2% of corporate business executives reported incomes in excess of $60,000 as the total annual income of the entire household. In contrast, only 21.4% of environmentalists and only 7.1% of the public reported this same level of income. The largest proportion of the public sample (37.2%) reported an annual income of $15,000-30,000, while the environmentalist sample was fairly well represented in all income categories over $15,000.

TABLE 4.11
THE SOCIO-ECONOMIC CHARACTERISTICS OF SURVEY RESPONDENTS: ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Socio-economic Variables	Environmentalist Sample %	Public Sample %	Business Sample %
Sex			
Male	78.3	46.2	96.0
Female	21.7	53.8	4.0
Totals (n)	(106)	(210)	(75)
Chi-square = 72.02; d.f. = 2; p<.0001			
Household Size			
1	16.0	10.6	4.0
2	39.6	26.0	29.3
3	19.8	26.0	25.3
>4	24.5	37.5	41.3
Totals (n)	(106)	(208)	(75)
Chi-square = 16.00; d.f. = 6; p<.013			
Age			
<26	6.6	15.7	0.0
26-35	46.2	38.6	6.7
36-45	25.51	19.5	18.7
46-55	10.4	14.8	40.0
>56	11.4	11.4	34.7
Totals (n)	(106)	(210)	(75)
Chi-square = 99.28; d.f. = 10; p<.0001			
Education			
Elementary	8.5	39.5	8.0
Secondary	12.3	27.1	14.7
University	79.2	33.3	77.3
Totals (n)	(106)	(210)	(75)
Chi-square = 83.54; d.f. = 4; p<.0001			
Income			
<$15,000	12.6	14.3	0.0
$15-30,000	20.4	37.2	1.4
$30-45,000	22.3	27.6	1.4
$45,000-60,000	23.3	13.8	4.1
>$60,000	21.4	7.1	93.2
Totals (n)	(103)	(196)	(74)
Chi-square = 211.66; d.f. = 8; p<.0001			

A comparison of socio-economic factors (Table 4.13) reveals many important differences and a few similarities among the three sample groups. In comparison with the public, environmentalists were younger and were generally higher in both education and income. When compared to the average member of the public, business executives were older, had a higher education and had a much higher income. Similarities between environmentalists and business executives were a preponderance of males and higher than average income and education.

The preceding examination of these socio-demographic variables indicates some of the initial differences in social composition among the three groups. These differences may exert an influence on such variables as energy preferences, environmental attitudes, or energy conservation behaviour. Socio-demographic variables will therefore be examined with respect to their influence on these variables in the following chapters.

G. CONCLUSION

Some differences in the perception of energy conservation, resource options, the Alberta environment and related issues have been examined in this chapter. The differences among the three sample groups are relatively consistent and when considered together the responses are generally in the expected direction. The specific findings may be summarized as follows:

1. Environmentalists generally regard themselves as more conservation-minded than others while the public and corporate business executives do not.
2. For environmentalists, the importance of saving energy is less pollution and environmental damage. Among the public and corporate business executives, saving energy means more energy available for the future.
3. Conventional oil supplies, over the next 25 years, are perceived to be a minor problem or no problem among the public or corporate business executives while environmentalists expect that they will be a major problem.
4. All three sample groups expect energy prices to rise within the next 15 years.

5. Environmentalists regard individual efforts to conserve energy as important. The public and corporate business executives regard energy conservation as somewhat less important.
6. While environmentalists perceive energy conservation as reducing environmental impacts, the public and corporate business executives perceive energy conservation as saving money or avoiding future shortages.
7. There are differences in the evaluations of energy resource options that would improve Canada's energy situation among the three groups. Environmentalists widely support energy conservation, solar energy, and wind energy, while, in contrast, corporate business executives support conventional fuels and nuclear energy. The public, however, are largely in support of a mix of energy resources that include natural gas, hydro-electric power, energy conservation, and solar energy.
8. The preferences for hard and soft path energy options differ among all three groups. While environmentalists are divided in their preference for hard and soft path energy options over the short run, the public and business executives indicate a preference for hard path options. However, over the long run, the public and especially environmentalists indicate a preference for soft path energy options, whereas business executives still support hard path energy options.
9. Environmentalists and the public evaluate their choice of energy options over the short and long run to have less environmental effects than those of other options. Corporate business executives evaluate their choice of energy options to stimulate more growth in the economy over the short run and to diversify Canada's energy resource base over the long run.
10. Regardless of affiliation, there are different reasons behind the choice of soft and hard path energy options over the long run. Those who choose soft path energy options are predominantly in favour of the environmental advantages. In contrast, those who chose hard path energy options favour, among other reasons, the diversification of Canada's energy resource base.
11. Concern for the environment in Alberta is highest among environmentalists. A higher

level of environmental concern is found among the public than is found among corporate business executives.

12. Most of the environmentalists and a large proportion of the public feel that the enforcement of environmental regulations in Alberta is not tough enough. Most corporate business executives regard the enforcement of such regulations to be about right.

There was a high degree of consistency among the responses from each sample group to the questions asked. Overall, the responses from environmentalists and corporate business executives to these questions are in the expected direction. For example, the response from environmentalists shows that they held opinions and beliefs that follow some of the tenets of the ecocentric position. Conversely, corporate business executives reflect opinions and beliefs that are considered part of the technocentric position. The responses from the public were generally between the responses given by these two target groups. In the next chapter, an examination of a measure of more fundamental environmental attitudes will help to explain the different variations in soft and hard path energy preferences between the three sample groups.

V. RELATIONSHIPS AMONG AFFILIATION, ATTITUDES, AND ENERGY PREFERENCES

A. ANALYSIS OF THE ENERGY, ENVIRONMENT, AND LIFESTYLE ATTITUDE SCALES

The construction of scales provides researchers with an important tool in the examination of relationships between attitudes and other variables, such as those investigated in this thesis. Analysis of the statements has been considered more useful in aggregate form than single statements on an individual basis (Dunlap and Van Liere, 1978). For the purpose of this thesis, three scales were constructed to distinguish differences in attitudes toward energy, the environment, and lifestyle among the three sample groups.

A five-point Likert scale was used to measure responses to the attitude statements in each scale. Responses to the environmental and energy attitude statements were scored with respect to the respondents' technocentric or ecocentric orientation. Responses to the lifestyle attitude statements were scored with respect to the respondents' consumer or conserver orientation. Scores were reversed where necessary and subsequently aggregated for analysis. A low mean-score represents an ecocentric or conserver orientation, while a higher mean-score represents a technocentric or consumer orientation among respondents.

All three sets of statements were analysed using the SPSSx reliability test. This test performs an item analysis of the components of additive scales by computing Cronbach's *alpha* coefficient of reliability. Test scores range from zero to one; a score of 0.4 or greater indicates an acceptable level of reliability. The *alpha* scores obtained from the energy, environmental, and lifestyle scales, were 0.77, 0.88, and 0.80 respectively. With regard to the environmental attitude scale, the *alpha* coefficient was consistent with previous findings. Dunlap and Van Liere (1978, 1984) reported *alpha* coefficients ranging from 0.77 to 0.88, while Jackson (1985a) indicated an *alpha* coefficient of 0.81.

An analysis of variance was performed to compare the mean-scores each sample group achieved with respect to the three attitude scales (Table 5.1). Judging by the size of the

F-statistic, the greatest difference in mean-scores among the three groups was found in the response to the energy and environment scales. Not only did the scales differentiate significantly among the three sample groups, but the differences were consistent and in the expected direction. On each of the three scales, there was a consistently low mean-score among environmentalists and a consistently high mean-score among corporate business executives. As expected, the mean-score of the public was between those of the two target groups.

TABLE 5.1
DIFFERENCES IN ATTITUDE SCALE MEAN-SCORES AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

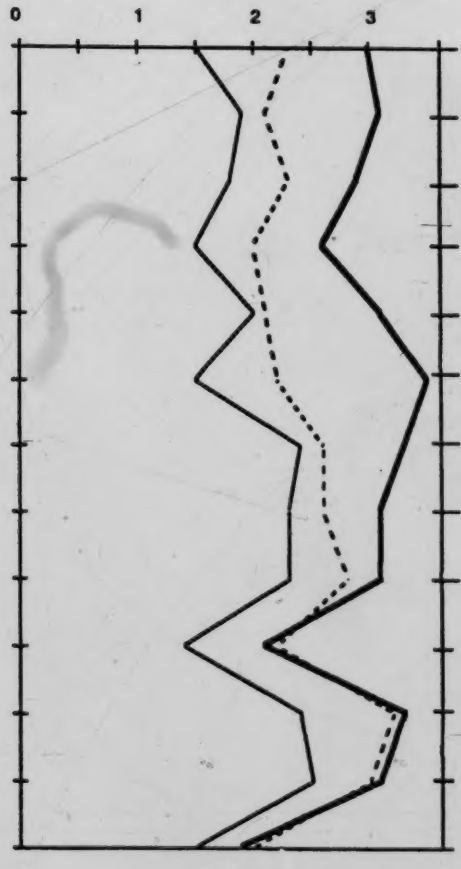
Attitude Scale	Environmentalist Sample Mean-Score	Public Sample Mean-Score	Business Sample Mean-Score	F	p<
Energy	25.76	32.05	37.96	87.27	.0001
Environment	46.97	60.39	66.39	86.02	.0001
Lifestyle	67.95	74.98	81.28	38.25	.0001

With respect to the energy and environment scales, a low mean-score among environmentalists represents an initial indication that they were more ecocentric in their orientation than the public. Conversely, a higher mean-score among corporate business executives reveals a more technocentric orientation in attitudes toward these issues than the public. The differences between the three groups were not as great with respect to the lifestyle scale. The differences, however, may be interpreted as a conserver orientation among environmentalists and a consumer orientation among business executives when both groups are compared to the public.

An analysis of variance was performed on the responses to each individual attitude statement, and a comparison of the mean scores of each sample group is illustrated in Figures 5.1, 5.2, and 5.3. The statements that compose each scale were arranged in a descending order from the greatest to the lowest difference in mean-scores. Differences with respect to specific statements were all significant with the exception of two items from the lifestyle scale. As in the previous section, the public response to individual statements was generally between the

FIGURE 5.1

ENERGY ATTITUDES SCALE*: MEAN SCORES



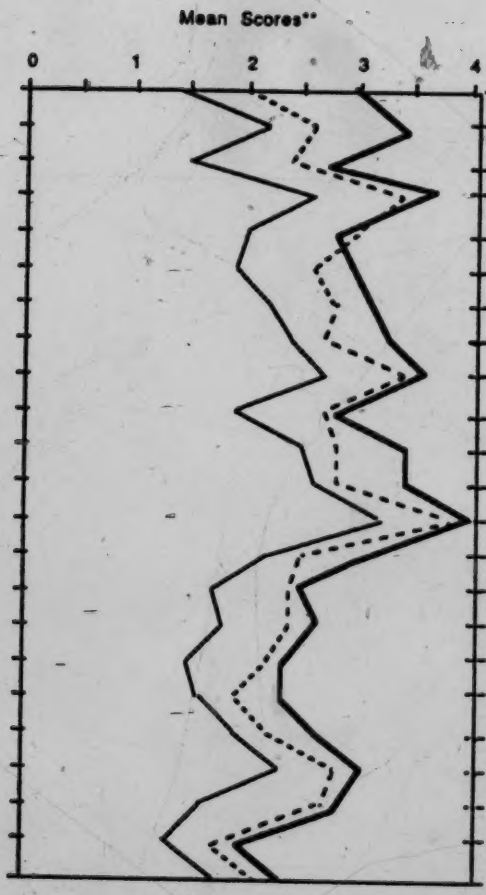
F	P<	Statements
49.79	.0001	(10) Environmentalists interfere with energy projects ***
28.85	.0001	(8) Operate nuclear energy plants without damaging environment ***
20.19	.0001	(1) Nuclear is the best way to meet future energy needs ***
27.04	.0001	(9) Environmental quality may have to be sacrificed***
31.63	.0001	(7) The solution is to develop renewable sources of energy
21.05	.0001	(4) Energy costs must be kept down ***
14.73	.0001	(13) Individuals should buy solar and wind devices
12.63	.0001	(6) Solving problems is best left to the experts***
14.50	.0001	(12) Shortages likely to become frequent
27.93	.0001	(5) Price of energy should include cost of environmental damage
12.60	.0001	(11) Canada's oil and gas are rapidly being depleted
08.67	.0002	(3) No threat of oil or gas shortage ***
06.65	.0014	(2) Moderation in consumption at the individual level

Environmentalist ——
Public - - - - - -
Business ——

* See Questionnaire appendix A, for complete statements.
** Mean-scores based on strongly agree 1; agree 2; neutral 3; disagree 4; strongly disagree 5.
*** Scores were reversed for the calculation of mean-scores.

FIGURE 5.2

ENVIRONMENTAL ATTITUDES SCALE*: MEAN SCORES



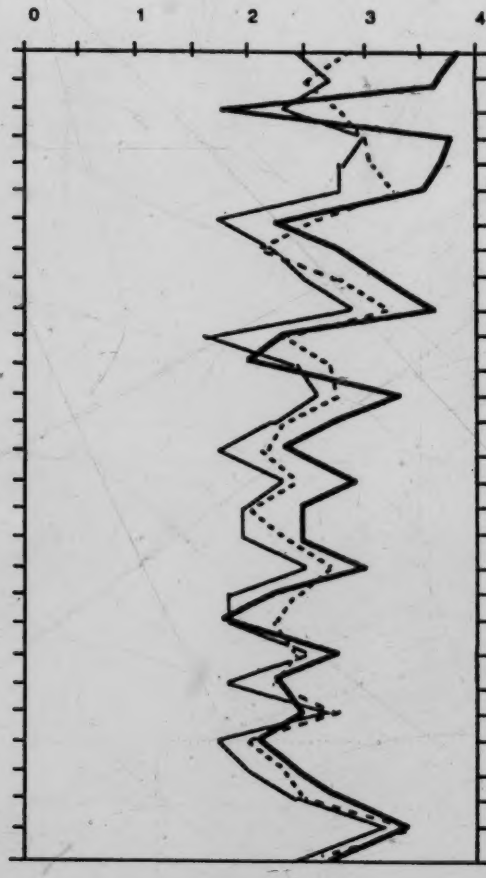
F	P≤	Statements
62.22	.0001	(11) Mankind abusing the environment
33.08	.0001	(15) Develop steady-state economy
33.00	.0001	(16) Rule over rest of nature ***
32.80	.0001	(8) Growth improves quality of life***
25.96	.0001	(1) No limits to living standards***
27.87	.0001	(6) Importance to economic measures
18.16	.0001	(12) Approaching limit to population
18.59	.0001	(20) Science and technology do harm
25.81	.0001	(13) Solve problems by technology***
23.51	.0001	(4) There are limits to growth
17.35	.0001	(21) Drastically reduce consumption
15.71	.0001	(18) Teach children about nature
24.18	.0001	(5) Cannot keep counting on science***
12.56	.0001	(22) Right to modify nature***
15.87	.0001	(3) Plants and animals exist for man***
20.22	.0001	(23) Benefits of economic growth***
24.92	.0001	(2) Earth is like a spaceship
15.18	.0001	(9) Balance of nature easily upset
13.94	.0001	(19) Disastrous consequences
10.31	.0001	(17) Better off if growth stopped
21.43	.0001	(10) Growth creates problems
16.10	.0001	(7) Must live in harmony with nature
08.48	.0002	(14) Need not adapt to environment***

Environmentalist ——————
Public - - - - - - -
Business ——————

* See Questionnaire appendix A, for complete statements.
** Mean-scores based on strongly agree 1; agree 2; neutral 3; disagree 4; strongly disagree 5.
*** Scores were reversed for the calculation of mean-scores.

FIGURE 5.3

LIFESTYLE ATTITUDES SCALE*: MEAN SCORES



F	P≤	Statements
32.31	.0001	(8) Walk or bike to work***
27.11	.0001	(27) Use charge card often
21.73	.0001	(28) Income high enough***
20.65	.0001	(29) Reluctant to change
14.83	.0001	(9) Material goals in life
13.49	.0001	(18) Aggresssive competition
21.80	.0001	(17) Outdoor recreation activities***
13.99	.0001	(1) Always check prices***
11.31	.0001	(22) Social status is important
10.15	.0001	(24) Prefer to rent***
21.70	.0001	(21) Mechanical recreation
15.79	.0001	(11) Most people are honest***
12.06	.0001	(26) Try to reduce costs***
12.06	.0001	(6) Develop skills***
15.52	.0001	(3) Prefer to use reuseables***
10.27	.0001	(14) Depend on experts
11.08	.0001	(7) Important to understand self***
11.45	.0001	(2) Dress for fashion
05.79	.0033	(5) Save for recycle or reuse***
15.89	.0001	(4) Pay more for efficient products***
10.23	.0001	(10) Work as income***
05.21	.0058	(19) Pay cash for most goods***
15.67	.0001	(15) Accumulation of goods***
04.38	.0131	(20) Work in a co-op situation***
08.94	.0002	(23) Product appearence important
03.69	.0257	(25) Use many convenience foods
02.68	n.s.	(12) Simplify lifestyle***
03.48	.0317	(13) Buy only the best products
02.16	n.s.	(16) Spender rather than saver

Environmentalist ——————
Public - - - - - - - -
Business ——————

* See Questionnaire appendix A, for complete statements.
** Mean-scores based on strongly agree 1; agree 2; neutral 3; disagree 4; strongly disagree 5.
*** Scores were reversed for the calculation of mean-scores.

responses given by environmentalists and corporate business executives. There were only a few exceptions from the expected responses to some statements in each scale.

The responses to individual energy attitude statements by the three sample groups were generally consistent and in the expected direction (Figure 5.1). Two statements, however, did not conform to the expected differences among the three sample groups. In two cases (statements 2 and 5), the public was not as sympathetic as the business executives were toward moderating energy consumption and toward including the environmental costs of energy development. In all cases, however, the lowest mean-scores occurred among the environmentalists.

Results from this analysis of energy attitudes were similar to those found in the previous analysis of energy evaluations and energy preferences (Chapter 4). Environmentalists were strongly in favour of energy reforms; corporate business executives, however, measured with reference to the energy attitude scale, were relatively neutral and non-commital toward many of the issues addressed and were therefore not as polarized as might have been expected. While an examination of the relationships between energy attitude, energy preference, and behaviour was intended, it was decided that measures of energy preference and energy attitudes were essentially the same. Energy attitudes (implicitly expressed in the evaluations of and preferences for energy options over the short and long run) will not be pursued any further. Instead, analysis of perceptual differences (preferences) among the three sample groups may prove to be more fruitful.

With respect to the environmental attitude scale, differences in responses from the three sample groups were also consistent and in the expected direction (Figure 5.2). Environmentalists and corporate business executives were definitely polarized with respect to all of the issues addressed in this scale. There was only one case (statement 1) in which the response by the public did not lie between the responses given by environmentalists and corporate business executives. The public, more than business executives, were in agreement with the statement that: "Over the long run, there are no limits to the extent to which we can raise our standard of living". Only on a few issues, such as teaching children about nature

and the benefits of science and technology, were the public in closer agreement with environmentalists than with corporate business executives.

The responses to individual attitude statements of the lifestyle scale were not as consistent as for the two previous scales (Figure 5.3). As a previously untested scale, it was not known if all of the attitude statements would be adequate to differentiate the responses from the three sample groups. As a result, only eighteen of the twenty-nine statements of this attitude scale differentiated significantly, consistently and in the expected direction. There were significant differences among the three groups with respect to statements 2, 3, 5, 6, 7, 8, 9, 12, 14, 15, 16, 18, 22, 23, 24, 25, 26, and 29 only. While the remaining scale items did not differentiate as expected, the above statements were useful in identifying some of the more important dimensions regarding lifestyle issues.

The statements regarding the consumer/conserver dichotomy that did stand out as good discriminators between the three groups reflected such dimensions as materialism, recyling, self-reliance, and an individual's objectives in life. These discriminators correspond well with the concepts of voluntary simplicity and the conserver society as put forth by Elgin (1982) and Valaskakis et al. (1974). These authors have asserted that such attitudes are necessary for reducing pollution and for resolving any energy or inflationary crisis that may appear in the future.

The remaining statements, which did not reflect the expected differences among the three groups, may be tapping certain dimensions that could be considered peripheral to consumer or conserver lifestyle attitudes. The response to statements regarding preferred methods of payment, income satisfaction, and recreation preferences were not uniform, but may reflect other influences such as income and age.

The eighteen statements that did reflect the expected differences among the three groups could have been separated into a smaller scale and examined further. However, as the entire lifestyle scale did not discriminate well enough as it was originally intended, further analysis was not warranted. Examination of the environmental attitude scale, which includes some statements regarding the quality of life, was pursued further and now becomes a main

focus of the attitudinal differences among the three sample groups.

B. THE ENVIRONMENTAL ATTITUDE SCALE

Each respondent's total scale score was computed by summing his or her scores on each of the 23 environmental attitude statements. The distribution of frequencies for these total scores is illustrated in Figure 5.4. Respondents' scores were plotted in aggregations of five to indicate the range and distribution of scores obtained in the survey.

The theoretical range of scores on the environmental attitude scale was from 23 (23 X 1) to 115 (23 X 5). The actual observed range of scores was 23 - 79 among environmentalists, 35 - 89 among the public, and 39 - 93 among corporate business executives. There was a tendency among corporate business executives and the public to avoid the theoretical extremes of environmental attitude. However, the distribution of scores among the three target groups supports the contention that corporate business executives tend to be slightly more technocentric in their orientation than the public and that most environmentalists reflect attitudes consistent with the ecocentric mode.

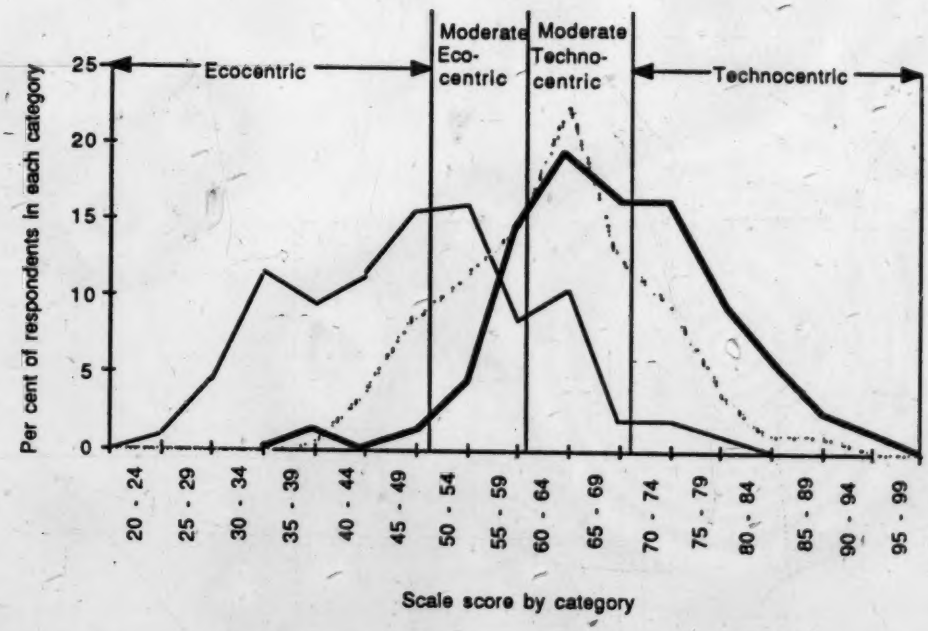
All three groups had mean-scores less than the theoretical mean-score of 69 (23 X 3 = neutral). Environmentalists had the lowest mean-score of 46.97 while corporate business executives had the highest mean-score of 66.39. The public mean-score of 60.39 corresponds well with comparative means from previous studies that have used similar scales (Farbrother, 1985; Jackson, 1985a). This finding also indicates that, consistent with previous studies (Farbrother, 1985; Jackson, 1985a), there is at least some acceptance of the tenets of the ecocentric mode among the public. Similarily, corporate business executives had a mean-score that is very close to the theoretical mean suggesting that they do not support either the technocentric or ecocentric modes.

Subdivision of the Environmental Attitude Scale

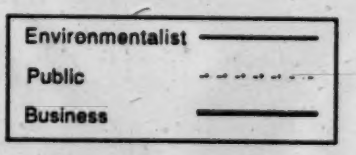
The discriminating power of the environmental attitude scale, as illustrated in the analysis of variance (Figure 5.2), showed differences among the three sample groups to be

FIGURE 5.4

ENVIRONMENTAL ATTITUDE SCALE: ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES



	Environmentalist	Public	Business
Mean	46.97	60.39	66.39
Median	48.00	61.00	66.00
Standard deviation	11.65	09.47	09.88
Skewness	.123	.176	.289



statistically significant at better than the .0001 level of probability for each statement. The validity and usefulness of combining the single item scores into a total environmental attitude scale and subdividing the samples along this dimension are supported. Subdividing the environmental attitude scale would allow crosstabulations to be performed.

Subdivision of the environmental attitude scale was carried out by dividing the distribution of scale scores in a similar manner and at equivalent points of division identical to those used by Jackson (1985a). Jackson defined environmental attitude subgroups by dividing the distribution of scale scores among 662 respondents from Edmonton and Calgary. Ecocentrists were defined as those respondents with scores greater than one standard deviation below the observed mean, and technocentrists were defined as respondents with scores greater than one standard deviation above the observed mean. The mid-groups were defined as follows: moderate ecocentrists were respondents with total scores less than one standard deviation below the observed mean, and moderate technocentrists were respondents with total scores less than one standard deviation above the observed mean.

Use of these subdivisions in the present study was based on the fact that such categories have proven satisfactory and have been appropriate for use in similar research efforts (Farbrother, 1985; Jackson, 1985a). The procedure for dividing the distribution of scale scores consisted of transposing equivalent points of division from Jackson's (1985a) study to the current study. Respondents were therefore classified into one of four attitude categories based on their total scale score. This procedure is based on the assumption that individuals with similar total scale scores would likely share similar attitudes and beliefs. The environmental scale was therefore subdivided into four attitude categories:

1. **Ecocentrists** - Attitudes consistent with the ecocentric mode.
2. **Moderate Ecocentrists** - Attitudes indicative of, but not totally consistent with, the ecocentric mode.
3. **Moderate technocentrists** - Attitudes indicative of, but not totally consistent with, the technocentric mode.
4. **Technocentrists** - Attitudes consistent with the technocentric mode.

Crosstabulations

The three groups were compared by cross-tabulating the respondents' affiliation by their environmental orientation (ecocentric, moderate ecocentric, moderate technocentric, and technocentric). In Table 5.2, 85.7% of the environmentalists could be classified as ecocentric or moderately ecocentric. Half of the public sample (49.2%) and one-quarter of the corporate business executives (27.5%) could be classified in the same manner. Conversely, 72.4% of the business executive sample could be classified as technocentric or moderately technocentric. Half the public sample (50.7%) could be similarily classified but only 14.3% of the environmentalists fit this orientation.

TABLE 5.2
ENVIRONMENTAL ATTITUDE SCALE: SUBGROUPS AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Environmental Orientation	Environmentalist Sample %	Public Sample %	Business Sample %
Ecocentrists	61.2	16.2	2.9
Moderate ecocentrists	24.5	33.0	24.7
Moderate technocentrists	13.3	38.7	47.8
Technocentrists	1.0	12.0	24.6
Totals (n)	(98)	(191)	(69)

Chi-square = 107.78; d.f. 6; $p<.0001$

These results suggest that the majority of the public were not totally supportive of either the technocentric or ecocentric modes. In the present study, 71.7% of the Edmonton public can be considered moderate ecocentrists or moderate technocentrists. Similar results were also found in previous surveys of environmental attitude among the public. The present findings correspond well with Farbrother's (1985) Edmonton study and Jackson's (1985a) Alberta study in which 69.0% and 69.4% respectively could be similarily classified.

The analysis of attitude orientation, based on categories rather than relative position on a distribution of scale scores, reflects a dichotomy in environmental attitudes among environmentalists and corporate business executives that was not readily apparent among public respondents. Among environmentalists, 85.7% reflected either ecocentric or moderately

ecocentric attitudes. In contrast, corporate business executives (72.4%) tended to reflect either technocentric or moderately technocentric attitudes. In this respect, the results confirm the contention that environmentalists have attitudes consistent with an ecocentric orientation, while corporate business executives have attitudes consistent with a technocentric orientation. Since the environmental attitude scale differentiated well between the three sample groups and has proven useful in previous studies, this scale will be considered in a further analysis of energy preferences and energy conservation behaviour. There may, however, be some variation in environmental attitude due to socio-economic factors and this will be discussed in the following section.

C. FURTHER EXAMINATION OF THE RELATIONSHIP BETWEEN AFFILIATION AND ENVIRONMENTAL ATTITUDE

A main focus of this study is the analysis of the influence of environmental attitudes on energy preferences and energy conservation behaviour among three distinct groups. Previous research, however, has suggested that environmental attitude may vary according to socio-economic factors (Van Liere and Dunlap, 1980). For this reason, affiliation-based differences in environmental attitude were examined for sources of variation that may be linked to socio-economic variables. In order to establish if there were sources of variation in environmental attitude crosstabulations were conducted.

Certain trends revealed that, when controlling for socio-economic variables, the relationship between environmental attitude and group affiliation was essentially maintained. A summary of significance levels reveals that thirteen of the sixteen tests were statistically significant at the 0.05 level of probability (Table 5.3).

When controlling for sex, the relationships between environmental attitude and group affiliation remained significant. Similarly, when controlling for age, the relationship between environmental attitude and group affiliation also remained significant. In the one category of age (>65) where this relationship was not significant, there was no apparent trend among respondents to any particular environmental orientation. With regard to the "education"

variable, only university and post-secondary educated respondents could be tested as there were too few environmentalists and corporate business executives in the other education category to permit analysis. When controlling for education, the relationship between environmental attitude and group affiliation remained significant within these two categories. With respect to controlling the "income" variable, the relationship between environmental attitude and group affiliation remained significant with the exception of those respondents whose income was between $15 - 30,000. There was no apparent trend among respondents to any particular environmental orientation within this category of income.

TABLE 5.3
SUMMARY OF SIGNIFICANCE LEVELS: RELATIONSHIPS BETWEEN ENVIRONMENTAL ATTITUDE AND AFFILIATION, CONTROLLING SOCIO-ECONOMIC VARIABLES

Affiliation and Attitude Controlling for Socio economic Variables	Significance Levels
Sex	
Male	.0001
Female	.0001
Age	
< 26	.07
26 - 35	.0007
36 - 45	.0001
46 - 55	.0001
56 - 65	.001
> 65	n.s.
Education	
School only	n.s.
Post-secondary	.05
University	.0001
Income	
< $15,000	.0002
$15 - 30,000	n.s.
$30 - 45,000	.0001
$45 - 60,000	.0001
> $60,000	.0001

In summary, the variations in environmental attitude between the three sample groups were basically maintained when socio-economic variables were held constant. The results suggest that affiliation-based differences in environmental attitude generally remain when

controlling for socio-economic factors, and therefore cannot be attributed to previously established socio-economic differences among the three groups.

D. THE INFLUENCE OF ENVIRONMENTAL ATTITUDES ON ENERGY PREFERENCES

In the previous analysis (Chapter 4) of group affiliation, there were significant differences in the preferences for certain energy options among respondents. Environmentalists and the public showed a preference for soft path energy options over the long run, and corporate business executives showed a preference for hard path energy options over both the short and long run. An examination of respondents by their environmental orientation, rather than their affiliation, may also differentiate preferences for either soft or hard path energy options.

The influence of environmental orientation on preferences for hard and soft path energy options for the short and long run is illustrated in Table 5.4. Statistically significant differences in these preferences were evident. Over the short run (next five years), slightly over half of the ecocentrists preferred the soft energy path, and the proportion doing so declined steadily across the other attitude groups to a low of only 10.0% among technocentrists. In contrast, the majority of technocentrists (90.0%) preferred the hard energy path, and the proportion doing so declined across the other attitude groups to a low of 46.0% among ecocentrists.

When longer time horizons were envisaged (beyond the year 2000), 77.3% of the ecocentrists preferred the soft energy path, and the proportion doing so declined across the other attitude groups to a low of 30.0% among technocentrists. Conversely, most technocentrists (70.0%) preferred the hard energy path, and the proportion doing so steadily declined across the other attitude groups to a low of only 22.7% among ecocentrists.

There was a distinct shift toward a preference for soft path energy options from the short to the long run among all four environmental attitude groupings. This shift was most noticeable among both moderate ecocentrists and moderate technocentrists. Among these moderates, there was almost a two fold gain in the preference for the soft energy path from

the short to the long run. In the short run, the moderates were predominantly in favour of the hard path, while over the long run the preference among them increased to be more in favour of the soft path. There was also a three fold shift in soft path energy preferences among technocentrists; however, the majority of these respondents still favoured hard path energy options over the long run. Overall, these results consistently show that preferences about energy resources are not random but depend, at least in part, on the respondents' environmental attitude.

TABLE 5.4
HARD AND SOFT PATH ENERGY PREFERENCES IN THE SHORT AND LONG RUN BY THE RESPONDENTS' ENVIRONMENTAL ATTITUDE

Preference	Ecocentric 1 %	2 %	3 %	Technocentric 4 %
Short Run				
Soft Path	54.0	32.4	24.4	10.0
Hard Path	46.0	67.6	75.6	90.0
Totals (n)	(87)	(102)	(119)	(40)
Chi-square = 31.20; d.f. = 3; p<.0001				
Preference	Ecocentric 1 %	2 %	3 %	Technocentric 4 %
Long Run				
Soft Path	77.3	61.0	47.9	30.0
Hard Path	22.7	39.0	52.1	70.0
Totals (n)	(88)	100	(117)	(40)
Chi-square = 31.31; d.f. = 3; p<.0001				

E. FURTHER EXAMINATION OF THE RELATIONSHIP BETWEEN ENVIRONMENTAL ATTITUDE AND ENERGY PREFERENCE

Previous analysis has shown that soft and hard path energy preferences vary with the respondents' affiliation (Chapter 4). At the beginning of this chapter environmental attitudes were shown to vary with the respondents' affiliation (Table 5.2), and subsequent analysis has revealed that hard and soft path energy preferences vary with the respondents' environmental

attitude (Table 5.4). To further the analysis it was necessary to examine the variation in energy preferences by controlling environmental attitudes among the three sample groups. It was also necessary to examine if attitude-based variations in energy preferences would also exist by holding group affiliation constant. Variations in long run energy preferences were examined because the differences were more apparent than variations for the short run (Chapter 4).

Crosstabulations showed that, while controlling for environmental attitude, the association between group affiliation and the differences in energy preferences remained, at least among moderate ecocentrists and moderate technocentrists (Table 5.5). Low sub-sample sizes precluded the conducting of similar tests among ecocentrists and technocentrists.

When group affiliation was controlled (Table 5.6), the association between environmental attitudes and the differences in preference remained among the public sample. The apparent lack of significance among environmentalists and corporate business executives may be due to the small sample sizes among these two target groups, especially the small number of technocentric environmentalists and ecocentric business executives.

F. CONCLUSION

This chapter has been an examination of three attitude scales and in particular the influence of environmental attitudes on energy preferences. The environmental attitude scale was found to be the best measure for differentiating the responses among the three sample groups. While the energy attitude scale differentiated well, it essentially considered the same elements of resource issues that were implicit in the preferences for future energy resouces. The lifestyle attitude scale, while a useful indicator of some relevant dimensions of lifestyle, contained a number of statements that did not satisfactorily discriminate the differences in attitude among the three groups. For these reasons, neither the energy nor lifestyle attitude scales were used in any further analysis. As a result of these findings, differences in environmental attitude among respondents were examined further. The conclusions from this analysis may be summarized as follows:

1. Environmentalists consistently have ecocentric attitudes toward energy resources and environmental issues. Environmentalists also have attitudes that may be considered consistent with a conserver type lifestyle. In contrast, corporate business executives generally have technocentric attitudes toward environmental issues but are non-commital in attitudes toward energy resources. Attitudes that may be expressed as consumer type lifestyles were also found among corporate business executives.
2. Affiliation-based differences in environmental attitude cannot be attributed to variations

TABLE 5.5
LONG RUN ENERGY PREFERENCES CONTROLLING FOR ENVIRONMENTAL ATTITUDES AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Preferences (Controlling for:)	Environmentalist Sample %	Public Sample %	Business Sample %
(Ecocentrists)			
Soft Path	82.8	67.9	50.0
Hard Path	17.2	32.1	50.0
Totals (n)	(58)	(28)	(2)*
Chi-square = 2.44; d.f. = 1; (n.s.)			
(Moderate ecocentrists)			
Soft path	69.6	65.6	31.3
Hard path	30.4	34.4	68.8
Totals (n)	(23)	(61)	(16)
Chi-square = 7.198; d.f. = 2; $p<.05$			
(Moderate technocentrists)			
Soft Path	69.2	56.3	21.2
Hard Path	30.8	43.7	78.8
Totals (n)	(13)	(71)	(33)
Chi-square = 13.81; d.f. = 2; $p<.001$			
(Technocentrists)			
Soft Path	00.0	31.8	29.4
Hard path	100.0	68.2	70.6
Totals (n)	(1)*	(22)	(17)
Chi-square = 0.026; d.f. = 1; (n.s.)			

*Excluded from analysis due to low values

TABLE 5.6
LONG RUN ENERGY PREFERENCES CONTROLLING FOR AFFILIATION AMONG RESPONDENT ENVIRONMENTAL ATTITUDE

Preferences (Controlling for:)	Ecocentrists 1 %	2 %	3 %	Technocentrists 4 %
(Environmentalist)				
Soft Path	82.8	69.6	69.2	00.0
Hard Path	17.2	30.4	43.7	100.0
Totals (n)	(58)	(23)	(13)	(1)*
Chi-square = 2.27; d.f. = 2; (n.s.)				
(Public)				
Soft Path	67.9	65.6	56.3	31.8
Hard Path	32.1	34.4	43.7	68.2
Totals (n)	(28)	(61)	(71)	(22)
Chi-square = 8.83; d.f. = 3; $p<.05$				
(Business)				
Soft Path	50.0	31.3	21.2	29.4
Hard Path	50.0	68.8	78.8	70.6
Totals (n)	(2)*	(16)	(33)	(17)
Chi-square = 1.30; d.f. = 2; (n.s.)				

*Excluded from analysis due to low values

in socio-economic characteristics.

3. An association exists between a respondent's environmental attitude and the respondent's preference for soft and hard path energy options over both the short and long run.
4. The differences in energy preference generally remain among the three sample groups when controlling environmental attitude. The differences, however, are only significant among moderate ecocentrists and moderate technocentrists. The differences in energy preference remain across the environmental attitude categories only among the public. The small sub-sample sizes precluded the conducting of similar tests among environmentalists and business executives.

To continue the present analysis, the influence of group affiliation and environmental attitudes on energy conservation behaviour will be examined in the following chapter.

VI. THE INFLUENCE OF GROUP AFFILIATION AND ENVIRONMENTAL ATTITUDES ON ENERGY CONSERVATION BEHAVIOUR

A. INTRODUCTION

It was shown in the previous chapters that group affiliation and environmental attitudes influence a respondent's perception of the energy issue and, in particular, the respondent's preference for energy options over the short and long run. This chapter is an examination of the influence of group affiliation and environmental attitude on the adoption of energy conservation behaviour among respondents. In other words, does group affiliation translate into energy conservation behaviour and do environmental attitudes play a significant role in this relationship?

B. THE REDUCTION OF ENERGY USE

Respondents were asked in Question 7 if they had "made any effort to reduce the amount of energy that you use?" The results from answering either "yes" or "no" to this question are examined in Table 6.1. A large proportion of respondents from each sample group replied "yes" to making an effort to reduce the amount of energy used. An affirmative response to this question was given by 70.8% of the public, 88.8% of the corporate business executives and 94.3% of the environmentalists. While the percentage difference among the three groups was statistically significant, the responses were not in the expected direction. Both environmentalists and business executives had made more of an effort to reduce the amount of energy used than the public.

A further examination of the respondents' effort to reduce the amount of energy use was performed. In this case, the response to Question 7 was crosstabulated with the respondents' environmental attitude (ecocentric, moderate ecocentric, moderate technocentric, technocentric). The results from this analysis are illustrated in Table 6.2. The percentage difference among the four environmental attitudes was not significant at the .05 level, but was consistent and in the expected direction. Of the ecocentric respondents, 88.2% replied yes to

making an effort to reduce the amount of energy. In comparison, 73.2% of the technocentric respondents responded to this question in the same manner. These results showed that regardless of environmental attitude or group affiliation, most respondents have made an effort to reduce the amount of energy they use.

TABLE 6.1
THE EFFORT MADE TO REDUCE THE AMOUNT OF ENERGY USED AMONG ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Energy Use Reduced	Environment-alist Sample %	Public Sample %	Business Sample %	Totals %
No	5.7	29.2	12.0	(19.6)
Yes	94.3	70.8	88.0	(80.4)
Totals (n)	(106)	(216)	(75)	(100.0)

Chi-square = 28.31; d.f. = 2; p< .0001

TABLE 6.2
THE EFFORT MADE TO REDUCE THE AMOUNT OF ENERGY USED BY THE RESPONDENTS' ENVIRONMENTAL ATTITUDE

Energy Use Reduced	Scale Orientation				
	Ecocentric 1 %	2 %	3 %	Technocentric 4 %	Totals %
No	11.8	17.3	24.2	26.8	(19.3)
Yes	88.2	82.7	75.8	73.2	(80.7)
Totals (n)	(93)	(104)	(120)	(41)	(100.0)

Chi-square = 6.92; d.f. = 3; (n.s.)

C. REPORTED ENERGY CONSERVATION BEHAVIOUR

If the respondent answered "yes" to Question 7, the respondent was asked to list those actions that he or she had taken to conserve energy or to promote energy conservation. From the open-ended Question 8, fifty-two energy conservation behaviours were obtained from the three sample groups. These behaviours ranged from the simple "turn off the lights" to the more complex and costly "had an energy efficient house built". None of the respondents

reported more than ten energy conserving practices. This was considerably less than the total number of adjustments listed by the respondents from all three sample groups.

Similar energy conserving practices were grouped together during the coding procedure. As a result, 43 groups of energy conservation behaviours were distinguished. A rank order frequency distribution of these 43 energy conservation practices is illustrated in Table 6.3. Turning the thermostat down, turning off lights, increasing house insulation, driving an energy efficient automobile, and changing driving practices were the top five energy conservation practices listed by respondents from all three sample groups.

D. ANALYSIS OF ENERGY CONSERVATION BEHAVIOUR BY GROUP AFFILIATION AND ENVIRONMENTAL ATTITUDE

Following a procedure adopted by Jackson (1980) and Farbrother (1985) it was decided not to analyse variations in specific practices but rather on the basis of the total number of practices and a small number of categories of energy conservation practices. An analysis of variance on the total number of energy conservation practices was performed to examine differences in adoption among the respondent's group affiliation and environmental attitude (Table 6.4).

Analysis of Variance

The analysis revealed that there were significant differences in the mean number of practices adopted according to the respondents' affiliation and environmental attitude. With respect to affiliation, the public and corporate business executives had adopted a lower average number of energy conserving practices (2.5 and 2.8 respectively) than environmentalists (4.6). The number of practices adopted among corporate business executives was only slightly higher than the number of practices adopted among the public.

With regard to the respondents' environmental attitude, ecocentrists were found to have adopted a mean number of practices (4.3) greater than the mean number of practices adopted by technocentrists (2.0). As expected, the respondents' adoption of energy

TABLE 6.3
FREQUENCY OF SPECIFIC ENERGY CONSERVATION PRACTICES
OF ALL RESPONDENTS

Energy Conservation Practice	Totals (n)	%
Turn thermostat down	188	47.4
Turn off lights	149	37.5
Insulation value of house increased	123	31.0
Drive energy efficient automobile	110	27.7
Change of driving practices	74	18.6
Conscientious use of electrical appliances	58	14.6
Use public transportation	45	11.3
Walk	41	10.3
Conscientious use of water	32	8.1
Weatherstrip residence	32	8.1
Bicycle	31	7.8
Install energy efficient thermostat	29	7.3
Recycle	27	6.8
Energy efficient furnace or fireplace	21	5.3
Conscientious use of electrical or gas utility	21	5.3
Use of cold water to wash clothes	19	4.8
Energy efficient doors or windows	19	4.8
Car pool	19	4.8
Maintenance of vehicle/s	17	4.3
Lower temperature of water tank	17	4.3
Turn off appliances when not in use	17	4.3
Buy energy efficient appliances	16	4.0
Use less	13	3.3
Use clothesline instead of dryer	13	3.3
Garden / Efficient farm	12	3.0
Regulate house temp through various behaviours	12	3.0
Maintainance of furnace or fireplace	9	2.3
Own an energy efficient home	9	2.3
Reuse	8	2.0
Install solar devices	8	2.0
Institute conservation practices at work	7	1.8
Water conservation devices (meters etc.)	6	1.5
Teach family and/or others about conservation	6	1.5
Low energy-consuming pastimes (hiking etc.)	6	1.5
Use only one car	5	1.3
Support energy or environmental causes	5	1.3
Vegetarian / use only natural fabrics	5	1.3
Work related to energy conservation industry	4	1.0
Convert vehicle to propane	4	1.0
Attend energy conservation lectures	3	.8
Circulation devices (fans etc.)	2	.5
Encourage employees to conserve	2	.5
Take holidays close to home	2	.5

TABLE 6.4
ANALYSIS OF VARIANCE: MEAN NUMBER OF PRACTICES BY RESPONDENTS' AFFILIATION AND ENVIRONMENTAL ORIENTATION

Affiliation	Mean No. of Practices Adopted	F	p<
Environmentalist	4.6	31.38	.0001
Public	2.5		
Business	2.8		
Environmental Orientation			
Ecocentric	4.3	13.74	.0001
Moderate ecocentric	3.3		
Moderate technocentric	2.6		
Technocentric	2.0		

conservation practices varied in relation to the respondents' environmental attitudes.

E. ADOPTION OF ENERGY CONSERVATION BEHAVIOURS

A focus of this thesis is to establish if there is a relationship between respondents' affiliation and their stated adoption of energy conservation behaviours. It may also be argued that a number of direct relationships might exist between respondents' environmental attitude and the adoption of these behaviours. Specifically, it was anticipated that there would be a relationship between the respondents' affiliation and their stated adoption of energy conservation behaviours. It was also expected that there would be an inverse relationship between a respondent's score on the environmental attitude scale and the number of energy conservation behaviours adopted.

Range of Energy Conservation Behaviours Adopted

In order to examine the intensity of adopting energy conservation practices, crosstabulations were performed on the number of reported energy conserving practices with respect to both the respondents' affiliation and environmental attitude. Respondents from each sample group were categorized with respect to their non-adoption, adoption of one to four, or five to ten energy conservation practices (Table 6.5).

There were significant and important differences among the three sample groups with regard to the adoption of a range of energy conservation practices. Corporate business executives (70.7%) were more likely to adopt only one to four energy conservation behaviours than either the public (46.8%) or environmentalists (37.7%). In contrast, the adoption of five to ten energy conservation practices was highest among environmentalists (53.8%), lower among the public (21.3%), and lowest among corporate business executives (13.3%).

TABLE 6.5
CROSSTABULATIONS: ADOPTION OF ENERGY CONSERVATION PRACTICES BY RESPONDENTS' AFFILIATION

Conservation Practices	Environmentalist Sample %	Public Sample %	Business Sample %
Did not adopt	8.5	31.9	16.0
Adopt 1 to 4 practices	37.7	46.8	70.7
Adopt 5 to 10 practices	53.8	21.3	13.3
Totals (n)	(106)	(216)	(75)

Chi-square = 63.03; d.f. = 4; $p<.0001$

Significant and important differences were also found with respect to the respondents' environmental attitude and the adoption of a range of energy conservation practices (Table 6.6). In this regard, there was a larger proportion of technocentrists (63.4%) than ecocentrists (37.6%) who adopted only one to four energy conservation practices. Of more importance, however, is the greater proportion of ecocentrists (47.3%) than technocentrists (4.9%) that adopted from five to ten energy conservation practices.

In summary, these results reveal that the likelihood of adopting a large number of energy conservation practices was associated with respondents having ecocentric environmental attitudes. In contrast, the adoption of only a few energy conservation practices can be associated with respondents having technocentric environmental attitudes. While affiliation and environmental attitude did not influence to any great extent the basic level of adopting or not adopting energy conservation behaviour, these variables were strongly associated with the propensity to adopt a range of energy conservation practices. This important finding reveals

that the differences in terms of behaviour were found with respect to the *range* of conservation practices adopted, and it is the *intensity* or *strength* of these behaviours that is influenced by group affiliation and environmental attitude.

TABLE 6.6
CROSSTABULATIONS: ADOPTION OF ENERGY CONSERVATION PRACTICES BY THE RESPONDENTS' ENVIRONMENTAL ORIENTATION

Conservation Practices	Ecocentric 1 %	2 %	3 %	Technocentric 4 %
Did not adopt	15.1	19.2	26.7	31.7
Adopt 1 to 4 practices	37.6	50.0	53.3	63.4
Adopt 5 to 10 practices	47.3	30.8	20.0	4.9
Totals (n)	(93)	(104)	(120)	(41)

Chi-square = 32.76; d.f. = 6; $p<.0001$

Categories of Energy Conservation Behaviour

The data on energy conservation behaviour were aggregated into eight categories (Table 6.7) to permit further crosstabulation analysis. The criteria for collapsing stated energy conserving behaviours into a more manageable format follow a similar procedure used by Farbrother (1985). The criteria were established to:

1. Keep comparable practices in the same category;
2. Keep practices of similar cost in the same category;
3. Ensure that a viable number of responses remain in each category to permit analysis.

In most cases these three criteria were satisfied. However, only criteria 1 and 2 were satisfied in category 7. This category had an absolute number of responses (17) which caused the data to be too small to permit analysis. Category 8 was included in the crosstabulation analysis because it was felt that, while these practices did not clearly indicate an energy conserving behaviour, the practices may stimulate energy conservation behaviour by others.

TABLE 6.7
CLASSIFICATION OF ENERGY CONSERVATION BEHAVIOURS

Category	Specific Examples
1. Energy loss prevention	Increase insulation; weatherstripping; heating system maintenance; efficient windows; storm doors.
2. Reduction of energy use	Reduce thermostat temperature; energy efficient thermostat or furnace; use less; recycle; reuse.
3. Efficient use of household appliances	Turn off lights, television, stereo, when not in use; use only energy efficient household appliances; conscientious use of electrical and gas appliances.
4. Use of and type of automobile	Drive smaller fuel efficient automobile; conscientious driving practices; maintain vehicle performance.
5. Alternative transportation	Use public transportation; car pool; walk; bicycle; non-motorized recreation activities.
6. Efficient use of water	Shower rather than bath; low-flow shower heads or water-saving devices; reduce water tank temperature; water meter installed.
7. Alternative house design	Solar house; energy efficient house design; solarium addition.
8. Teach-Initiate	Lecture on energy conservation; initiate practices at work; promote energy conservation among friends.

Analysis of Energy Conservation Categories and Respondent Affiliation

An analysis of the variation in the adoption of energy conservation categories can be found in a summary of crosstabulations in Table 6.8. There were significant differences among the three sample groups with respect to the adoption of five categories of energy

conservation behaviour (reduction of energy use, use of and type of automobile, alternative transportation, alternative house design, and teach-initiate). There were, however, no significant differences among the three groups in the adoption of energy loss prevention, efficient use of household appliances, and efficient use of water.

TABLE 6.8
VARIATION IN THE ADOPTION OF ENERGY CONSERVING PRACTICES BY ALBERTA ENVIRONMENTALISTS, THE EDMONTON PUBLIC, AND ALBERTA CORPORATE BUSINESS EXECUTIVES

Energy Conservation Behaviours Adopted	Environmentalist Sample %	Public Sample %	Business Sample %	Chi-square	p<
Energy loss prevention	39.6	31.5	50.7	9.10	n.s.
Reduction of energy use	78.3	48.6	56.0	25.86	.0001
Efficient use of household appliances	57.5	44.4	37.3	8.09	n.s.
Use of and type of automobile	61.3	29.2	62.7	42.78	.0001
Alternative transportation	45.3	22.7	6.7	36.55	.0001
Efficient use of water	18.9	14.8	12.0	1.70	n.s.
Alternative house design	7.6	1.4	8.0	9.70	.007
Teach-initiate	9.4	1.4	10.7	14.52	.0007

Degrees of freedom = 2 in each case

The differences among the three groups that were significant and in the expected direction occurred in only one energy conservation category. A greater proportion of environmentalists (45.3%) than either the public (22.7%) or the corporate business executives (6.7%) reported having adopted alternative transportation practices. In the remaining categories, there were more corporate business executives that stated energy loss prevention, reduced fuel consumption through use of and type of automobile, and used alternative house designs than either the public or environmentalists. However, environmentalists and the public had a higher adoption of practices that generally cost less. They were more likely to use alternative transportation and get more efficient use from their household appliances. While it was expected that business executives would adopt fewer energy conservation practices of each category, they may be in a financial position in which it becomes easier to adopt particular

energy conservation measures.

Analysis of Energy Conservation Categories and Environmental Attitudes

In a further analysis of the specific characteristics of the relationship between attitudes and behaviour, the environmental attitudes scale was collapsed into the four categories used previously (ecocentric, moderate ecocentric, moderate technocentric, technocentric). Conservation practices were analysed with respect to these categories using crosstabulations (Table 6.9).

TABLE 6.9
VARIATION IN THE ADOPTION OF ENERGY CONSERVING PRACTICES BY THE RESPONDENTS' ENVIRONMENTAL ATTITUDE

Energy Conservation Behaviours Adopted	Ecocentric 1 %	2 %	3 %	Technocentric 4 %	Chi-square	p<
Energy loss prevention	36.6	44.2	35.0	29.3	3.55	n.s.
Reduction of energy use	74.2	64.4	48.3	43.9	19.67	.0002
Efficient use of household appliances	59.1	47.1	43.3	31.7	9.99	n.s.
Use of and type of automobile	60.2	46.2	36.7	36.6	13.22	.004
Alternative transportation	39.8	25.0	20.8	14.6	13.56	.004
Efficient use of water	20.4	13.5	12.5	4.9	6.29	.001
Alternative house design	4.3	5.8	4.2	0.0	2.44	n.s.
Teach-initiate	9.7	3.8	4.2	2.4	4.96	n.s.

Degrees of freedom = 2 in all cases

The analysis revealed that there were significant differences in the stated adoption of four of eight energy conservation behaviour categories. These behaviours include reduction of energy use, use of and type of automobile, alternative transportation, and efficient use of water. A greater proportion of ecocentrists (74.2%) than technocentrists (43.9%) adopted practices that reduced energy use. With respect to use of and type of automobile, nearly twice as many ecocentrists (60.2%) as technocentrists (36.6%) took steps to conserve energy. More than twice as many ecocentrists (39.8%) adopted alternative transportation practices as technocentrists (14.6%). There were also four times as many ecocentrists (20.4) who adopted

efficient use of water practices as technocentrists (4.9%).

There were no significant differences among the environmental attitudes with respect to the adoption of the energy loss prevention, efficient use of household appliances, alternative house design, and teach-initiate categories. Despite this finding, respondents with an ecocentric and moderate-ecocentric attitude were found to be consistently higher in their adoption of each category of energy conservation behaviour than respondents with a moderate-technocentric or technocentric attitude. Overall, these results indicate that environmental attitudes, as well as group affiliation, play an important role in the adoption of different categories of energy conservation behaviour.

F. CONCLUSION

The results presented in this chapter suggest that there is a relationship between group affiliation and the adoption of energy conservation behaviours. There is also evidence to support the contention that there is a link between environmental attitudes and stated energy conservation behaviours. Specifically, the stated adoption of energy conservation practices may be explained, at least in part, with reference to fundamental environmental attitudes and beliefs. These relationships may be summarized as follows:

1. The majority of respondents, regardless of their affiliation, have adopted at least one or more energy conservation practices; however, none of the respondents adopted the full range of energy conservation behaviours.
2. With regard to environmental attitude, slightly more ecocentrists than technocentrists made an effort to reduce the amount of energy used.
3. The energy conservation practices most respondents frequently adopted were to turn the thermostat down, turn off the lights, increase the amount of insulation used, and drive an energy efficient automobile.
4. Environmentalists adopted a mean number of energy conservation practices that was greater than the mean number of practices adopted by either the public or corporate business executives. The frequency of adopting energy conservation practices was low

among both the public and corporate business executives.

5. Respondents with attitudes consistent with the ecocentric mode tended to adopt more energy conservation practices than respondents with attitudes consistent with the technocentric mode.
6. Variations in the adoption of a range of energy conservation practices may be partly explained with reference to differences in affiliation. More than half of the environmentalist sample adopted between five and ten energy conservation practices. Less than one-quarter of the public sample and even fewer corporate business executives adopted as many practices.
7. Variations in the adoption of a range of energy conservation practices may also be partly explained with reference to environmentally-based attitudes. Respondents with attitudes consistent with the ecocentric attitude were approximately 10 times more likely than respondents with attitudes consistent with the technocentric attitude to have adopted between five and ten energy conservation practices.
8. Significant differences were found among the three sample groups with respect to the adoption of five of eight categories of energy conservation behaviour.
9. Significant differences were also found among the environmentally-based attitudes of respondents and their adoption of four of eight categories of energy conservation behaviour.

The main finding of this chapter is that the adoption of energy conservation practices may be understood with reference to the respondents' affiliation and environmental attitude. While the propensity to reduce energy use was only weakly explained by affiliation, the intensity of adopting a range of energy conservation practices was strongly influenced by both affiliation and environmental attitude. This important finding reveals that there is a definite distinction between a basic level of conservation and the intensity of adopting a number of different energy conservation practices.

It was found that group affiliation and environmental attitude also affect the adoption of certain categories of energy conservation behaviour. Some authors have suggested that

certain barriers or constraints prevent a strong relationship between attitudes and behaviour (Farbrother, 1985; Jackson, 1980a; Jackson and Foster, 1982; Karns and Khera, 1983). The identification and interpretation of such barriers and constraints should be considered in further studies of attitudes and behaviour.

CONCLUSIONS

A. SUMMARY

This study represents an empirical investigation of the energy preferences, environmental attitudes, and energy conservation behaviours of Alberta environmentalists, the Edmonton public, and Alberta corporate business executives. The study was designed to determine whether energy preferences and energy conservation behaviours could be understood with reference to the individual's fundamental environmental attitude and to the individual's affiliation to business or environmental interests. The results showed that there were significant and consistent differences in perceptions, preferences, attitudes, and behaviours among the three sample groups.

The focus of the is on energy preferences and energy conservation behaviours, and differences were found to exist in attitudes toward the environment, energy, and lifestyle issues among the three sample groups. Specifically, differences in energy preferences and energy conservation behaviours were found to be associated with group affiliation and environmental attitude. In this respect, the thesis has augmented ongoing research into the influence that environmental attitudes have on both energy preferences and energy conservation behaviour. The current study has findings consistent with previous studies that have investigated the public with respect to the same variables (Farbrother, 1985; Jackson, 1985a). Of more importance, this study has explored the rationale behind the respondents' most preferred energy options, investigated the role of lifestyle attitudes, and examined the attitudes and behaviour of two diverse interest groups. A summary of the results from this survey and the subsequent analysis is as follows:

1. ***The Edmonton public, Alberta environmentalists, and Alberta corporate business executives can be differentiated with respect to their perceptions of energy conservation, the importance of conserving energy, and their concern with maintaining the quality of the Alberta environment.***

   This finding was supported by the responses of the three sample groups to several

questions. The differences in these responses were significant, consistent, and in the expected direction. The results support the contention that most environmentalists perceive themselves to be more conservation-minded than others, perceive a reduction of pollution and environmental damage as the most important benefit from saving energy, perceive oil supplies as a major problem, believe individual efforts to conserve energy to be important, and view conservation as having benefits that will reduce environmental impacts. In contrast, a large proportion of the public and most of the corporate business executives perceive themselves to be less conservation-minded than others, perceive more energy available for the future as the most important benefit from saving energy, perceive oil supplies as a minor problem or no problem at all, and believe individual efforts to conserve energy are not too important, but view conservation as having benefits that will save them money and avoid future shortages. All three sample groups believed that energy prices will rise over the next fifteen years.

Differences were also found among the three groups in their concern for the environment and effective enforcement of environmental regulations. Most environmentalists and much of the public were more concerned than corporate business executives with maintaining the quality of the Alberta environment and believed the enforcement of environmental regulations by the Alberta government to be not tough enough. A majority of corporate business executives were less concerned than environmentalists and the public with maintaining the quality of the Alberta environment and believed the enforcement of environmental regulations by the Alberta government to be about right. Aggregate public opinion was not as extreme as the opinions of either environmentalists or corporate business executives with respect to energy conservation and the Alberta environment.

2. ***There are significant differences among the Edmonton public, Alberta environmentalists and Alberta corporate business executives with respect to their evaluations of and preferences for energy resource options.***

Evaluations of energy options differed significantly among the three groups with regard

to all but one energy resource category (prairie coal). The greatest differences were among the evaluations for solar energy, nuclear energy, wind energy, and conventional oil in contributing to the improvement of Canada's energy situation. Environmentalists and the public evaluated solar energy much higher than corporate business executives who, in contrast, had a much higher evaluation of conventional fuels and nuclear energy.

Preferences for these energy options over the short run (the next five years) and the long run (beyond the year 2000) also varied significantly among the three sample groups. Over the short run, environmentalists were largely in favour of conserving energy; the public preferred a continued use of a wide range of fosssil fuels; and corporate business executives largely supported conventional oil and natural gas. Over the long run, differences in preferences among the three sample groups became more sharply defined; environmentalists focussed their support on conserving energy and solar energy; the public largely favoured solar energy; and most corporate business executives favoured oil from tar sands, nuclear energy, and natural gas.

When the specific options were classified into hard and soft paths, environmentalists were largely in favour of soft path options while corporate business executives were largely in favour of hard path options over the long run. The public preferred a mix of both soft and hard path options over the short run, but lent support for soft path options over the long run. This finding is similar to previous research where long run support for soft path energy options was found among the public (Brady, 1980; Cunningham and Lopreato, 1977; Farbrother, 1985; Jackson, 1985a). The energy preferences of the Edmonton public and Alberta environmentalists differred substantially from those of the corporate business executives who were largely in favour of hard path options. The differences between these groups were greater in the long run than in the short run. Corporate business executive preference for hard path options was only slightly diminished as longer time horizons were envisaged.

3. ***The reasons for selecting preferred energy resource options over the short and long run differ among Alberta environmentalists, the Edmonton public and Alberta corporate***

business executives.

Environmentalists and the public believed that their most preferred choice of energy options over both the short and long run will have less environmental effects than those of other options. Corporate business executives, in contrast, believed that their most preferred choice of energy options will stimulate more growth in the economy in the short run and will diversify Canada's energy resource base over the long run.

4. *Alberta environmentalists, the Edmonton public, and Alberta corporate business executives differ in their attitudes and opinions toward energy, environmental, and lifestyle issues.*

Three scales were used to examine differences in attitude among the three sample groups. Differences were most evident with respect to environmental attitudes. Environmentalists generally had an ecocentric attitude toward environmental and energy issues and had attitudes consistent with a conserver type of lifestyle. Corporate business executives, in contrast, generally had a technocentric attitude toward environmental issues and had attitudes consistent with a consumer type of lifestyle. The Edmonton public, an aggregation of diverse opinions, generally had attitudes toward these issues that were between those of the environmentalists and the business executives.

With regard to the environmental attitude scale, the samples were subdivided according to respondents' scores into four internally consistent groups (ecocentric, moderately ecocentric, moderately technocentric, and technocentric). All three sample groups could thus be differentiated in terms of their relative level of support for the ecocentric (NEP) or technocentric (DSP) modes. In this respect, environmentalists could be classified as predominantly ecocentric while a large proportion of corporate business executives could be classified as moderately technocentric. The Edmonton public could only be categorized as both moderately ecocentric and moderately technocentric. These results support previous research findings, in which fundamental values and beliefs (world views) could be understood with reference to environmental issues among the public (Dunlap and Van Liere, 1978, 1984), among environmentalists and industrialists (Cotgrove, 1982), and among environmentalists and the public (Dunlap and Van Liere,

1978).

These results suggest that the Edmonton public sample was not totally supportive of either the technocentric or ecocentric modes. However, the mean-score of this group was found to be consistent with previous studies (Dunlap and Van Liere, 1978, 1984; Farbrother, 1985; Jackson, 1985a). This particular aspect of the findings sugggests that the public may have accepted the dimensions of the ecocentric mode to an extent greater than would be expected.

5. *There is little influence of socio-economic variables on the relationship between affiliation and environmental attitudes.*

Respondents' socio-economic characteristics were found to have generally little influence on the relationship between environmentalist or business executive affiliation and environmental attitudes, values, and beliefs.

6. *Preferences for energy resource options over the short and long run are associated with environmental attitude.*

Specifically, respondents classified as ecocentrists were found to favour soft path energy options, while respondents classified as technocentrists were found to favour hard path energy options in both the short and long run.

7. *Preferences for hard path energy options diminish over the long run.*

Regardless of the respondents' affiliation, there was a proportionate decrease in the preferences for hard path energy options across each of the environmental attitude categories.

8. *Preference for energy resource options generally remains when controlling either group affiliation or environmental attitude.*

When controlling environmental attitude, the association between group affiliation and long run energy preference was found to remain among both moderate ecocentrists and moderate technocentrists. Among respondents with these environmental attitudes, preferences for soft energy paths were found among the public and environmentalists while a preference for hard energy paths was found among corporate business executives.

When controlling group affiliation, the association between environmental attitude and long run energy preferences was found to remain among the public. In this sample group, preferences for soft path energy options were found among ecocentrists, moderate ecocentrists, and moderate technocentrists. Both group affiliation and environmental attitude are therefore believed to influence preferences for long run energy options.

9. *The adoption of energy conservation practices differs among the Edmonton public, Alberta corporate business executives and Alberta environmentalists.*

   The majority of respondents from each sample group adopted at least one or more energy conservation practices; however, significant differences in the average number of practices adopted were found to exist among the three sample groups. On average, environmentalists adopted more energy conservation practices than either the public or corporate business executives. The most important finding was that a large proportion of environmentalists listed more than five practices while much of the public and most corporate business executives listed less than five energy conservation practices.

10. *The adoption of most energy conservation practices by the Edmonton public, Alberta corporate business executives, and Alberta environmentalists involves minimal inconvenience and cost.*

    The most common energy conservation behaviours that were adopted by all respondents include turning the thermostat down, turning off lights, and increasing the insulation value of the house. Most of the energy conservation behaviours that were adopted were relatively easy to perform and required a minimum amount of effort or cost to the respondent. A similar conclusion was obtained in other research efforts (Farbrother, 1985; Jackson, 1980a; McDougall et al., 1979).

11. *The adoption of energy conservation practices is associated with the respondents' environmental attitude.*

    Results suggest that variations in energy conservation behaviours could partially be explained with reference to the respondents' environmental attitude (world views).

Respondents with attitudes consistent with the ecocentric mode tended to adopt more energy conservation practices than respondents with attitudes consistent with the technocentric mode.

The respondents' environmental attitude was also found to influence the range of energy conservation practices adopted. Ecocentric respondents tended to adopt more than five practices while technocentric respondents tended to adopt less than five practices.

12. *The intensity of adopting a range of energy conservation behaviours is strongly influenced by both group affiliation and environmental attitude.*

While the propensity to adopt energy use was only weakly explained by affiliation, the intensity of adopting a wide range of energy conservation practices was strongly influenced by both group affiliation and environmental attitude. This finding distinguishes the difference between a basic level of conservation and the intensity of adopting a number of different energy conservation practices.

Summary Synthesis

The main objective of this thesis has been to further our understanding of the relationships among environmental attitudes, energy preferences, and energy conservation behaviour. The study was directed at examining these relationships and comparing the differences that were expected to exist with respect to a respondent's affiliation to either the public, environmental, or corporate business interests. The conclusions have supported previous research findings (Farbrother, 1985; Jackson, 1985a) with regard to these relationships among the public. The conclusions have also revealed new information about differences between environmentalists and corporate business executives with respect to some of their perceptions, attitudes, and energy conservation behaviours.

Among environmentalists there was a great deal of unity in their perceptions about conservation and in their concern with the Alberta environment. Their preference for soft path energy options and their propensity to adopt a range of different energy conservation practices are reflections of these perceptions and concerns. The rationale for selecting soft

path energy options (e.g. energy conservation, solar energy) was based on the perception that the environmental effects would be fewer than those of other options. These perceptions, preferences, and behaviours were also reflected in their environmental attitude (or worldview) and in their attitudes toward general energy and lifestyle issues. An ecocentric environmental attitude was found among most environmentalists, and the relationship of this attitude to energy preference and energy conservation behaviour was established.

Corporate business executives percieved conservation quite differently and were less concerned with the Alberta environment than environmentalists. Their preference for hard path energy options and their propensity to adopt a smaller range of different energy conservation practices are a reflection of these perceptions and concerns. The rationale for selecting hard path energy options (e.g. non-renewable fossil fuels, nuclear energy) was based on the perception that economic growth will be stimulated. These perceptions, preferences and behaviours were also reflected in their environmental attitude and in their attitudes toward general energy and lifestyle issues. A moderately technocentric to technocentric environmental attitude was found among most corporate business executives, and the relationship of this attitude to energy preference and energy conservation behaviour was also established.

The public generally had responses that were between those of the two target groups. While they had perceptions of conservation similar to business executives, they differed in their concern about maintaining the quality of the Alberta environment. Like environmentalists, the public showed a preference for soft path energy options over the long run. Their propensity to adopt conservation behaviours was as low as that reported by business executives. While most of the public were either moderately ecocentric to moderately technocentric it was still established that, regardless of affiliation, the respondents' environmental attitude could be associated with energy preference and the propensity to adopt energy conservation behaviours.

The study also demonstrated the link between environmental attitude and the ***range*** or ***intensity*** of energy conservation behaviours adopted. In a similar manner, affiliation could also be linked to the adoption of a range of energy conservation behaviours. Thus while most

respondents claimed to have adopted at least one energy conservation practice, it was the range of energy conservation behaviours that was differentiated by affiliation and environmental attitude. Significant differences were also found with respect to the adoption of certain categories of energy conservation behaviour.

B. LIMITATIONS OF THE SURVEY

Although many conclusions may be drawn from this research effort, a number of limitations can also be identified. Recognition of these limitations and the problems encountered in the survey process are now addressed.

First, and most important, the study drew for comparison purposes three sample groups that were small in size. While the return rates from the self-administered questionnaire were satisfactory, the small total number of returns from the environmentalist and business executive groups may have obscured the results from multi-variate analysis.

Secondly, the sample of the Edmonton public cannot be considered as representative of all Albertans; at best the findings can be generalized to residents of the two largest cities. Comparison of this group to Alberta environmentalists and Alberta corporate business executives must be regarded with this in mind.

The data were derived solely from a questionnaire survey and a third limitation can be identified in its use. The most important difficulty lies in the reliance on the respondents' *stated* rather than their *actual* behaviour. Problems of this kind were discussed earlier (Chapter 3) and have been encountered in previous research on energy-related behaviours (Farbrother, 1985; Jackson, 1980a). The results of this study must be viewed within the confines of this limitation.

The fourth limitation associated with this study regards the formulation of the attitude scales. The study examined three different scales, of which only one (the environmental attitude scale) proved to be of use in any subsequent analysis. The two other attitude scales were dropped for reasons that were discussed earlier (Chapter 5). The environmental attitude scale was based on a refinement of earlier scales (Dunlap and Van

Liere, 1978, 1984; Jackson, 1985a). However, as with any attitude scale, limitations exist with respect to the assumed ability of the scale to measure the various dimensions of environmental issues and whether the statements used actually tap the respondents' attitudes.

Some of these limitations were recognized and many of them are common to research that relies on data collected through a self-administered questionnaire. The first problem may be ameliorated by using samples of larger sizes. However, this was precluded due to time and cost constraints. The second problem limits the application of the results to comparisons only within the province of Alberta. The third and fourth limitation regarding questionnaire surveys may be alleviated with the use of a more comprehensive research design and further refinement of appropriate environmental attitude statements. However, further tinkering with the environmental attitude statements may preclude their comparisons with previous research on energy preferences and energy conservation behaviour.

C. SOME FUTURE RESEARCH DIRECTIONS

A few research directions may now be suggested as a result of the conclusions drawn from this study. Interrelationships have been discussed with respect to the influence that group affiliation and environmental attitude have on energy preferences and energy conservation behaviour. It is important to advance the state of present research by examining the attitudes, preferences, and behaviours of other populations for either similarities or differences. Do people from other areas of the public domain show a commitment to either the ecocentric or technocentric mode, and can other sub-populations be differentiated according to these world views? Analysis of some specific sub-sections of the public may be an alternative direction of research. For example, do differences in attitude exist between labour leaders and government decision-makers or between urban and rural populations? A comparison of the differences between the populations of resource rich and resource poor provinces would also be useful in further studies of attitude and behaviour.

Much of the research efforts already undertaken are in a formative stage and further replication is required. Previous studies have led to the present research effort and together

these studies have begun to provide a cohesive body of literature on attitudes, preferences, and behaviours toward energy, the environment, and social lifestyle issues. Attitudes toward government energy and environmental policy (both present and proposed) may also provide a fruitful avenue for research. If energy evaluations, preferences, and the rationale behind the choice of energy options were to be pursued further, a comprehensive listing of available energy options and reasons for selecting these options would be recommended.

Lifestyles are also an important component of both attitude and behaviour, and further study of this concept as a dependent and independent variable is also warranted. Associated with lifestyles is the role advertising has on the formation of attitudes. This role has implications for subsequent lifestyle behaviours and may also be useful in advancing studies of preference and behaviour.

Identification of the numerous factors that influence actual and perceived barriers to the adoption of energy conservation behaviours is also necessary. While some socio-economic variables have been examined in this study, a host of other factors may exist that could influence both energy preference and energy conservation behaviour. Alternative methodologies may be more useful than a self-administered questionnaire to obtain data of adequate size to alleviate data analysis problems. Structured interviews and longitudinal studies have some advantages such as flexibility and greater response rates; however, they are much more costly to perform than a questionnaire survey. Questionnaire content could also be improved by obtaining accurate measures of energy conservation behaviour. Actual household energy consumption figures could be used as a dependent variable in further studies. More study is therefore required to further our understanding of the factors associated with perception, attitude, and behaviour.

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Appendix A

The Questionnaire

ENERGY, ENVIRONMENT, AND LIFESTYLE:

A SURVEY OF ALBERTANS' OPINIONS

Energy, Environment, and Lifestyle Project
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THE QUESTIONNAIRE IS DIVIDED INTO SEVERAL SECTIONS. THE FIRST FEW QUESTIONS DEAL WITH YOUR OPINIONS ABOUT CONSERVATION IN GENERAL AND ENERGY CONSERVATION IN PARTICULAR.

Q-1 In comparison with other people, would you say you are more conservation-minded, less conservation-minded, or about the same? (Circle *one* number).

1 MORE CONSERVATION-MINDED

2 LESS CONSERVATION-MINDED

3 ABOUT THE SAME

Q-2 What, if anything, would you say is the *most important* good thing that happens when energy is saved? (Circle *one* number).

1 MORE ENERGY WILL BE AVAILABLE FOR THE FUTURE

2 ENERGY PRICES WILL COME DOWN

3 IMPORTS OF FOREIGN OIL WILL BE REDUCED

4 THERE WILL BE LESS POLLUTION AND ENVIRONMENTAL DAMAGE

5 OTHER (Please specify)_____

Q-3 Do you expect the supply of conventional oil resources to be a problem *for the world as a whole* in the next twenty-five years? (Circle *one* number).

1 MAJOR SUPPLY PROBLEM

2 MINOR SUPPLY PROBLEM

3 NO PROBLEM AT ALL

Q-4 What are your expectations regarding the future of energy prices for the next 15 years? (Circle *one* number).

1 ENERGY PRICES WILL GO UP

2 ENERGY PRICES WILL REMAIN THE SAME

3 ENERGY PRICES WILL GO DOWN

4 DON'T KNOW

Q-5 How important do you feel it is that individual people like yourself make an effort to cut down on the amount of energy that they use? (Circle *one* number).

1 NOT AT ALL IMPORTANT

2 NOT TOO IMPORTANT

3 SOMEWHAT IMPORTANT

4 VERY IMPORTANT

Q-6 What, if anything, would you say is the *most important* reason for conserving energy? (Circle *one* number).

1 IT SAVES MONEY

2 IT IS MORALLY RESPONSIBLE TO DO SO

3 IT IS AN ENJOYABLE PRACTICE

4 TO HELP AVOID FUTURE SHORTAGES

5 TO REDUCE IMPACTS ON ENVIRONMENT

6 OTHER (Please specify)_____

Q-7 Have you made any effort to reduce the amount of energy that you use? (Circle *one* number).

1 NO (Skip to question 9 on the next page)

2 YES

Q-8 Please list what you have done to conserve energy or promote energy conservation. For example, in your household, your place of work, your transportation practices, or your personal habits.

A_____

B_____

C_____

D_____

E_____

F_____

G_____

H_____

I_____

J_____

NOW HERE ARE SOME QUESTIONS ABOUT VARIOUS TYPES OF ENERGY.

Q-9 A number of energy options are available to Canada. For *each* of the following, please indicate how you would rate its potential to make a major contribution to improving Canada's energy situation. (Circle the appropriate number for *each*).

	Poor	Fair	Good	Very Good	Excellent
(1) COAL FROM PRAIRIE REGIONS	1	2	3	4	5
(2) COAL FROM MOUNTAIN REGIONS	1	2	3	4	5
(3) CONVENTIONAL OIL SOURCES	1	2	3	4	5
(4) OFFSHORE OIL SOURCES (eg. Beaufort Sea)	1	2	3	4	5
(5) CONSERVING ENERGY	1	2	3	4	5
(6) SOLAR ENERGY	1	2	3	4	5
(7) NUCLEAR POWER	1	2	3	4	5
(8) OIL FROM TAR SANDS	1	2	3	4	5
(9) NATURAL GAS	1	2	3	4	5
(10) HYDRO-ELECTRIC POWER	1	2	3	4	5
(11) WIND ENERGY	1	2	3	4	5
(12) OTHER (Please specify) _____	1	2	3	4	5

Q-10 In the *short run* (say in the next five years), which of the items listed in Question 9 do you think would help improve Canada's energy situation *the fastest*? (Put number of item in appropriate box).

[ ] BEST IN THE SHORT RUN

[ ] SECOND BEST IN THE SHORT RUN

Q-11 What, if anything, would you say is the *most important* reason for your choice of the best energy option in the short run? (Circle *one* number).

1 THERE ARE NO OTHER ALTERNATIVES

2 IT HAS THE ADVANTAGE OF CREATING MORE JOBS

3 ITS ENVIRONMENTAL EFFECTS ARE LESS THAN THOSE OF OTHER OPTIONS

4 IT WILL STIMULATE MORE GROWTH IN THE ECONOMY

5 IT WILL DIVERSIFY CANADA'S ENERGY RESOURCE BASE

6 OTHER (Please specify)_____

Q-12 In the *long run* (beyond the year 2000), which of the items listed in Question 9 do you think Canada *should depend on most* to improve its energy situation? (Put number of item in appropriate box).

[ ] BEST IN THE LONG RUN

[ ] SECOND BEST IN THE LONG RUN

Q-13 What, if anything, would you say is the *most important* reason for your choice of the best energy option in the long run? (Circle *one* number).

1 THERE ARE NO OTHER ALTERNATIVES

2 IT HAS THE ADVANTAGE OF CREATING MORE JOBS

3 ITS ENVIRONMENTAL EFFECTS ARE LESS THAN THOSE OF OTHER OPTIONS

4 IT WILL STIMULATE MORE GROWTH IN THE ECONOMY

5 IT WILL DIVERSIFY CANADA'S ENERGY RESOURCE BASE

6 OTHER (Please specify)_____

Q-14 Here are some statements that various people have made about energy resources and energy policy. As in Question 9, please read each statement carefully, then circle the number that corresponds *most closely* to your opinion about the statement. There are no right or wrong answers: I am only interested in *your* opinion.

This is what the numbers mean:

1 indicates you *strongly disagree* with the statement
2 indicates you disagree, but *not* strongly
3 indicates you are neutral or indifferent
4 indicates you agree but, *not* strongly
5 indicates you *strongly agree* with the statement

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The development of nuclear power plants is the best way to meet future energy needs	1	2	3	4	5
Moderation in consumption at the individual level can contribute significantly to energy conservation.	1	2	3	4	5
There is no threat of an oil or natural gas shortage, only a shortage of known and identified resources.....	1	2	3	4	5
Energy costs must be kept down, even if this means a reduction in environmental protection.....	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The price of energy should include the cost of preventing or repairing environmental damage due to energy development	1	2	3	4	5
Solving energy problems is best left to experts	1	2	3	4	5
The solution to energy problems is the rapid development of renewable sources of energy such as solar or wind power	1	2	3	4	5
Nuclear power plants can be operated without a threat to the quality of the environment	1	2	3	4	5
Environmental quality may have to be sacrificed in order to guarantee adequate supplies of energy	1	2	3	4	5
The environmentalists needlessly interfere with energy projects and the rapid development of our oil, natural gas, and coal resources	1	2	3	4	5
Canada's supplies of oil and natural gas are rapidly being depleted	1	2	3	4	5
Economically disruptive energy shortages are likely to become frequent if we go on as we are	1	2	3	4	5
In the future, individuals should be expected to buy solar or wind devices to meet part of their own energy needs	1	2	3	4	5

QUESTIONS 15 AND 16 DEAL WITH YOUR CONCERN ABOUT THE ENVIRONMENT IN ALBERTA.

Q-15 How concerned are you about maintaining or improving the quality of the environment in Alberta? (Circle *one* number).

1 VERY CONCERNED

2 MODERATELY CONCERNED

3 NOT VERY CONCERNED

4 NOT AT ALL CONCERNED

Q-16 How do you feel about the enforcement of environmental regulations by the Government of Alberta. (Circle *one* number).

1 TOO TOUGH

2 ABOUT RIGHT

3 NOT TOUGH ENOUGH

4 NO OPINION

THE NEXT SECTION DEALS WITH A NUMBER OF ISSUES RELATED TO THE ENVIRONMENT.

Q-17 Here are some statements dealing with issues related to resources, economic activity, the quality of life and the environment. As in Question 14, please read each statement carefully, then circle the number that corresponds *most closely* to your opinion about the statement. There are no right or wrong answers: I am only interested in *your* opinion.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In the long run, there are no limits to the extent to which we can raise our standard of living	1	2	3	4	5
The earth is like a spaceship with only limited room and resources	1	2	3	4	5
Plants and animals exist primarily to be used by humans	1	2	3	4	5
There are limits to growth beyond which our industrialized society cannot expand	1	2	3	4	5
We can continue to raise our standard of living through the application of science and technology.	1	2	3	4	5
We attach too much importance to economic measures of the level of well-being in our society	1	2	3	4	5
Humans must live in harmony with nature in order to survive	1	2	3	4	5
Economic growth improves the quality of life for all Canadians	1	2	3	4	5
The balance of nature is very delicate and easily upset	1	2	3	4	5
Rapid economic growth often creates more problems than benefits	1	2	3	4	5
Mankind is severely abusing the environment	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
We are approaching the limit to the number of people the earth can support	1	2	3	4	5
Most problems can be solved by applying more and better technology	1	2	3	4	5
Humans need not adapt to the environment because they can remake it to suit their needs	1	2	3	4	5
To maintain a healthy economy, we will have to develop a "steady-state" economy where industrial growth is controlled	1	2	3	4	5
Mankind was created to rule over the rest of nature	1	2	3	4	5
We cannot keep counting on science and technology to solve mankind's problems	1	2	3	4	5
More emphasis should be placed on teaching children about nature than on teaching them about science and technology	1	2	3	4	5
When humans interfere with nature it often produces disastrous consequences	1	2	3	4	5
Science and technology often do as much harm as good	1	2	3	4	5
Canadians are going to have to drastically reduce their consumption of material goods over the next few years	1	2	3	4	5
Humans have the right to modify the environment to suit their needs	1	2	3	4	5
The positive benefits of economic growth far outweigh any consequences	1	2	3	4	5

Q-18 What, if anything, do you think will happen to the general quality of life for all Albertans in the next 10 years? (Circle *one* number).

1 IMPROVE

2 STAY THE SAME

3 DETERIORATE

THE FOLLOWING QUESTIONS DEAL WITH VARIOUS ASPECTS OF LIFESTYLE.

Q-19 Now here are some more statements, this time describing aspects of lifestyle and consumer behaviour. As in Question 17, please read each statement carefully, then circle the number that corresponds *most closely* to *your* personal view about the statement. There are no right or wrong answers: I am only interested in your activities, interests, and opinions.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I find myself checking the prices in the grocery store even for small items	1	2	3	4	5
When I must choose between the two, I usually dress for fashion, not for comfort	1	2	3	4	5
I prefer to buy more reusable products than disposable ones	1	2	3	4	5
I will pay more for energy-efficient products	1	2	3	4	5
I always save metal, glass, or paper products for recycling or reuse	1	2	3	4	5
I spend a lot of time developing skills to be able to do things myself	1	2	3	4	5
In general, it is more important to understand my inner self than to be famous, powerful, or wealthy	1	2	3	4	5
I will often use public transit, walk, or bicycle to work	1	2	3	4	5
Material well being is an important goal in life	1	2	3	4	5
Work, to me, is much more than a source of income	1	2	3	4	5
Generally speaking, most people are trustworthy and honest	1	2	3	4	5
I have consciously made an effort to simplify my life	1	2	3	4	5
Whenever I shop for major items, I tend to buy the best product or nothing at all	1	2	3	4	5
I depend on experts to get things done properly around the house	1	2	3	4	5
The accumulation of many consumer goods is not always rewarding	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am a "spender" rather than a "saver"	1	2	3	4	5
I often participate in physically active outdoor recreation	1	2	3	4	5
In order to get ahead in life, one has to be aggressively competitive	1	2	3	4	5
I like to pay cash for everything I buy	1	2	3	4	5
I have participated in working on community or co-operative projects in my neighbourhood	1	2	3	4	5
Most of my recreation involves the use of mechanized equipment	1	2	3	4	5
My social status is an important part of my life	1	2	3	4	5
I am more concerned with a product's appearance than its durability	1	2	3	4	5
Rather than buy an expensive item, I prefer to rent it first or buy it second-hand	1	2	3	4	5
I prefer to use prepared or frozen foods for the convenience	1	2	3	4	5
I gain more satisfaction from reducing my costs rather than increasing my income	1	2	3	4	5
I buy many things with a charge card or a credit card	1	2	3	4	5
Our family income is high enough to satisfy nearly all our important desires	1	2	3	4	5
I would be very reluctant to make changes in the lifestyle I have become accustomed to	1	2	3	4	5

Q-20 In comparison with other people *like yourself*, do you have lower levels of general consumer consumption, higher levels of general consumer consumption, or about the same? (Circle *one* number).

1 LOWER

2 HIGHER

3 ABOUT THE SAME

FINALLY, I WOULD LIKE A FEW FACTS ABOUT YOURSELF. THESE QUESTIONS WILL BE USED FOR CLASSIFICATION PURPOSES ONLY. LIKE THE REST OF THE QUESTIONNAIRE, YOUR ANSWERS WILL BE KEPT COMPLETELY CONFIDENTIAL.

Q-21 Are you male or female? (Circle number).

1 MALE

2 FEMALE

Q-22 How many people, including yourself and any children, live in your household? (Circle number).

1 ONE

2 TWO

3 THREE

4 FOUR OR MORE

Q-23 To which of the following age groups do you belong? (Circle number).

1 UP TO 25

2 26 TO 35

3 36 TO 45

4 46 TO 55

5 56 TO 65

6 OVER 65

Q-24 What is the highest level of formal education that you have achieved? (Circle number).

1 ELEMENTARY (UP TO GRADE 6)

2 SECONDARY (UP TO GRADE 12 OR 13)

3 POST-SECONDARY/TECHNICAL

4 SOME UNIVERSITY

5 UNIVERSITY GRADUATE

6 POST-GRADUATE

Q-25 In which of the following categories does the total annual income of your entire household fall? (Circle number).

1 LESS THAN $15,000

2 $15,000 to $30,000

3 $30,000 to $45,000

4 $45,000 to $60,000

5 $60,000 AND OVER

Is there anything else you would like to express about the topics dealt with in this questionnaire? If so, please use this space for that purpose.

Thank you. I hope you enjoyed the questionnaire. I look forward to receiving your answers. Your contribution to this project is very much appreciated.

Appendix B

The Letter of Introduction

DEPARTMENT OF GEOGRAPHY
TELEPHONE (403) 432-3274

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA T6G 2H4

ENERGY, ENVIRONMENT, AND LIFESTYLE PROJECT

Dear Sir or Madam:

Energy and environment are important issues that affect everyones' lifestyle. These issues are of interest to many Albertans and are likely to become more important in the future. If policy-makers are to make the right choices then it is useful to know how the public feels about these matters.

I respectfully ask your help in completing the enclosed questionnaire and returning it as soon as possible. Your answers and ideas are important! A stamped addressed envelope is included in the package for your convenience.

I would like to emphasise that your answers will be treated in the strictest confidence. To ensure that you remain totally anonymous, please do not identify yourself in any way on the questionnaire. Once your questionnaire is returned, I will have *no way of identifying who has filled it out.*

This is an independent research project. The results will be made available to Alberta policy-makers in energy and the environment. No personal information will be released from the survey. Also, the questionnaire forms will be destroyed as soon as the results are analysed.

The success of this survey depends on your cooperation. Please take the time to complete the questionnaire and return it in the enclosed envelope. I would be most happy to answer any questions you might have. Please write or call. The telephone numbers are 432-4158 or 426-1746 (evenings).

Thank you for your assistance.

Sincerely,

Jon N. Rodgers
Graduate Student

JNR/sf

Appendix C

The Reminder Postcards

ENERGY, ENVIRONMENT, AND LIFESTYLE PROJECT
DEPARTMENT OF GEOGRAPHY, UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA T6G 2H4

Dear Sir or Madam,

About one week ago I mailed you a questionnaire designed to find out Alberta's opinions about energy, environment, and lifestyle issues.

This card is being sent to everyone who received the questionnaire. As I pointed out in the original letter, the survey is completely anonymous, and I have no way of telling if your questionnaire is one of those already returned. If you have filled out and returned your questionnaire, I would like to thank you for your cooperation.

The success of the survey depends on the help of all who received the questionnaire. If you have not already completed it and mailed it back to me, I would be grateful if you would do so.

Once again, thank you for your participation in the survey.

Sincerely,

Jon Rodgers
Graduate Student

ENERGY, ENVIRONMENT, AND LIFESTYLE PROJECT
DEPARTMENT OF GEOGRAPHY, UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA T6G 2H4

Dear Sir or Madam,

About two weeks ago I mailed you a questionnaire designed to find out Alberta's opinions about energy, environment, and lifestyle issues.

This card is being sent to everyone who received the questionnaire. As I pointed out in the original letter, the survey is completely anonymous, and I have no way of telling if your questionnaire is one of those already returned. If you have filled out and returned your questionnaire, I would like to thank you for your cooperation.

The success of the survey depends on the help of all who received the questionnaire. If you have not already completed it and mailed it back to me, I would be grateful if you would do so. If the questionnaire has been misplaced I will gladly replace it. Please write to me at the above address.

Once again, thank you for your participation in the survey.

Sincerely,

Jon Rodgers
Graduate Student